Health
Building Note 44

MC0155

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Accommodation for ambulance services

NHS Estates
An Executive Agency of the Department of Health

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London : HMSO

NHS Estates
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First published 1994

ISBN 0 11 321710 2

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About this publication

The Health Building Note series is intended to give advice on the briefing and design implications of Department of Health policy. These Notes are prepared in consultation with representatives of the National Health Service and appropriate bodies. Health Building Notes are aimed at multidisciplinary teams engaged in:

a. designing new buildings;

b. adapting or extending existing buildings.

Throughout the series, particular attention is paid to the relationship between the design of a given department and its subsequent management. Since this equation will have important implications for capital and running costs, alternative solutions are sometimes proposed. The intention is to give the reader informed guidance on which to base design decisions.

Health Building Note 44

Health Building Note (HBN) 44 focuses on ambulance service accommodation requirements for ambulance stations, communications centres and workshops.

This Note recommends and assumes that the chief ambulance officer/chief engineer, fleet engineer and other specialist staff will be involved from the earliest stages of any project.

Acknowledgements

NHS Estates gratefully acknowledge all contributions to this document, in particular the assistance given by Norfolk Ambulance NHS Trust and the Ambulance Service Committee drawn from the services listed below:

Bedfordshire and Hertfordshire ambulance and paramedic service;

Avon Ambulance Service NHS Trust;

Northumbria Ambulance Service NHS Trust;

West Midlands Ambulance Service NHS Trust.

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1.0 Scope

Introduction

1.1 Health Building Note (HBN) 44 provides guidance on the planning and design of all ambulance stations, from those accommodating only one or two vehicles to the very large housing 30 or more vehicles. It replaces Local Authority Building Note No 7 issued in January 1965.

Inclusions

1.2 This Note includes guidance for ambulance stations which have training and/or minor vehicle maintenance and repair facilities. It also provides information on workshops (capable of maintenance and repair of vehicles up to approximately 4 tonnes) and on the accommodation required for a main communications centre.

Exclusions

1.3 Guidance for the administrative headquarters of an ambulance service is excluded.

Capricode

1.4 Capricode is the mandatory procedural framework, governing the inception, planning, processing and control of individual health building schemes. The aim is to promote a consistent and streamlined approach to capital development that achieves best use of resources through the selection and construction of relevant and cost effective schemes that open on time and within budget. It identifies the main activities and provides a framework for delegation with effective management and the proper accounting for expenditure and performance – see 'Capricode Health Building Procedures' issued with HN(86)32 (in Wales, WHC(86)62).

Cost allowances

1.5 The Departmental Cost Allowances associated with this Note are promulgated in an Annex to an Estate Executive Letter issued separately.

Equipment

1.6 Equipment relating to this Note is categorised into four groups:

- **Group 1**
  Items (including engineering terminal outlets) supplied and fixed within the terms of the building contract;
- **Group 2**
  Items which have space and/or building construction and/or engineering service requirements and are fixed within the terms of the building contract but supplied under arrangements separate from the building contract;
- **Group 3**
  As group 2, but supplied and fixed (or placed in position) under arrangements separate from the building contract;
- **Group 4**
  Items supplied under arrangements separate from the building contract, possibly with storage implications but otherwise having no effect on space or engineering service requirements.

Works Guidance Index

1.7 This Note contains guidance that is current at the time of publication. Specific issues such as arrangements for dealing with fire, security, energy conservation, etc are covered by other published guidance which must also be taken into account. Some aspects of the guidance in this Note may from time to time be amended or qualified. Project teams should check the current edition of the Works Guidance Index. Because the Index is published by NHS Estates in May each year, and updated in September and January, project teams should ensure that they investigate the possibility of changes occurring after the latest published Index.

2.0 General service considerations

The ambulance service

2.1 The National Health Service Act 1977 places a duty on the Secretary of State to provide ambulance services capable of meeting all reasonable requirements. Briefly, these are:

a. any person may request the services of an ambulance, usually by making a "999" call, for accidents or sudden illness anywhere. An ambulance must be despatched immediately in response to such a call. Medical authority is not necessary;

b. ambulance services are also required to provide, or arrange the provision of, suitable transport, free of charge, for any patient (emergency or non-emergency) considered by a doctor, dentist or midwife to be medically unfit to travel by other means. The patient may be conveyed to the nearest hospital or treatment centre, NHS convalescent home, doctor's or dentist's surgery or disablement service centres.

In meeting these requirements, ambulance services are expected to achieve certain standards of performance (see HSC(IS)67 (in Wales, WHSC(IS)57)) particularly in responding to emergency calls. These will influence the scale and siting of the resources devoted to this task.

The ambulance station

2.2 The operational base for the service is the ambulance station, which usually functions on a 24-hour basis. It will accommodate the vehicles and staff deployed by the service to meet the variety of needs of the population served by that station. Invariably, a range of vehicles will be needed:

a. two-trolley ambulances;

b. dual-purpose vehicles for stretcher or sitting-case patients;

c. sitting-case vehicles of various sizes;

d. cars and/or estate cars.

2.3 In some cases, accommodation may also be required for more specialist vehicles such as:

- communications or equipment vehicles for use in major incidents;
- recovery vehicles;
- maintenance vehicles;
- supply vehicles.

2.4 Facilities also have to be provided for the administrative work of the station; recreation and possibly training of staff; catering; sanitary and changing requirements; and the storage of supplies and equipment.

2.5 It is important that the chief ambulance officer/chief executive concerned should be consulted **at a very early stage** in the planning of a new station. It is also appropriate for the chief ambulance officer to prepare a "users'" brief and be consulted at various stages of the development.

2.6 The scale and type of provision at a station will depend on a number of variable factors: for instance, the demography and geography of the area served, pattern of demand to be met, the working relationship of one site to another, and any special local features. Such a degree of variation will have considerable significance for the selection of a site, and the size and type of facilities to be provided – see Chapters 3 and 4. In addition, purchasers' commitment needs to be confirmed to support the revenue costs of the new building, including the capital charge which will form part of their future prices. The planning and development of a new ambulance station must not be considered in isolation from an authority's overall strategic plan. Particular attention should be given to the role the ambulance service may have to play in relation to non-ambulance activities, for example non-ambulance transport or communications.

Site selection

2.7 The selection of a suitable site will be influenced by various factors, some of which are identified below:

- there is a close working relationship between ambulance staff and the staff of hospital departments, and discussions should take place on the merits of developing new ambulance stations in hospital grounds, as site sharing could enable advantage to be taken of certain common services. If the station is on a hospital site, independent access to the public road network is highly desirable and is essential when a rapid response emergency vehicle is one of the fleet;
- any suitable industrial/warehouse units or other premises should be given serious consideration when discussing the siting and provision of new or upgraded ambulance stations;
- a site with a one-way system is preferable as it ensures free and unrestricted movement of vehicles, and traffic flow can be controlled to give precedence to designated emergency vehicles;

- the site should have adequate access through the public road network to the area it serves. It is recommended that the same planning criteria be sought as for fire/police stations in relation to public highway access/egress. Direct access to roads where traffic conditions inhibit unrestricted movement of ambulances should be avoided if at all possible. Where this is unavoidable, particular care should be taken to ensure the adequacy of sight lines for emerging vehicles, and due regard given to the need to consider traffic signal controls in the light of criteria laid down in The Home Office Fire Service Circular No. 43/72 – 'Traffic light signals outside fire/ambulance stations';
- with new ambulance stations, any integrated arrangements for the management and control of ambulance and non-ambulance transport fleets should be taken into account and due regard paid to the space requirements of the non-ambulance transport garaging, maintenance, storage and staff. The district transport manager (if appropriate) should be consulted at an early stage of planning;
- the relationship of one site to another, particularly in conurbations having a network of main and sub-stations, should be carefully analysed to ensure that adequate back-up is available to maintain standards during peak periods of demand;
- geographical constraints, road networks, traffic routes, level crossings, limited access to and egress from major roads, dual carriageways etc are major factors to be taken into account when considering the maintenance of rapid response times for the likely level of demand;
- the location and density of the population, the road network, climatic problems and relative costs will influence whether services should be sited at a small number of large stations as opposed to a wider geographical dispersion of smaller stations. This is a matter for local decision. Even when the demographic and geographical factors appear broadly similar, considerable variations exist between services in terms of the number and siting of vehicles, stations and staff;
- adequate car parking facilities, plus external covered accommodation for motorcycles and bicycles, will be needed because most stations will have staff working on a shift basis who will be unable to use public transport;
- there will be a requirement to provide a workshop for the repair and maintenance of vehicles.

Storage requirements

2.8 Storage and distribution facilities – some secure and specialised – will be needed for supplies and equipment, cleansing and disinfection requisites. Medical supplies required for use by ambulance staff will be stored at the station. Medical supplies, including drugs required for use by ambulance staff, should be stored in accordance with the appropriate legislation.

Summary of facilities required in an ambulance station

2.9 Project teams will need to consider provision of the following facilities for an ambulance station:

a. heating, ventilation, lighting, normal and stand-by electrical power;

b. lubricant storage;

c. vehicle fuel storage and dispenser;

d. boiler fuel storage, where appropriate;

e. vehicle washing;

f. storage for a wide range of equipment, from medical gas cylinders to linen and blankets;

g. refuse and waste disposal;

h. entrances for staff, visitors and vehicles;

j. administrative offices;

k. staff training, rest, recreation, catering, sanitary facilities and changing rooms;

m. a loud-speaker system on larger stations;

n. a station identification signboard visible from adjacent public roads (essential);

p. an illuminated enquiry sign, directing visitors to reception, visible from the public approach to the station.

3.0 Operational ambulance station functional and design requirements

Introduction

3.1 This chapter provides design guidance based on the service objectives outlined in Chapter 2, and includes information on a range of topics and environmental matters which should be taken into account when designing ambulance stations. The chapter comprises:

a. general matters – damage to buildings and security;

b. environmental considerations – lighting, ventilation, etc;

c. size of stations.

Damage

3.2 When designing and equipping ambulance stations,the likely occurrence and effects of accidental damage should be considered. To minimise accidental damage,the access space for vehicles – particularly articulated vehicles or estate cars with trailers – must be taken into account. Adequate space for entry and exit is required. Advice will need to be taken at an early stage about access, turning circle, vehicle testing spaces and vehicle cleaning requirements, to ensure that none of these activities hampers another and creates a potential hazard.

Security and safety

3.3 Nowadays assaults on staff and theft of NHS property are recognised problems. The project team should discuss security with the officer in charge of the local police crime prevention department and the hospital or district security officer or adviser at an early stage in the design of the building. Fire and security officers should be consulted concurrently because the demands of security and fire safety may sometimes conflict. Secure arrangements will be needed for stores and equipment (which may include medicines and medical gases) held in vehicles, garages, workshops and stores. The attention of planners is drawn to Health Service Guidelines HSG(92)22 (in Wales, WHC(92)46) about security and the revised NHS Security Manual to which it refers.

3.4 With regard to safety, the main factors to be taken into account relate to staff and the public in respect of vehicles, in particular, the safety of the public when vehicles are emerging onto a public road. This will be aided by adequate signposting of the station. The local authority should also be consulted.

Lighting, ventilation etc

3.5 Orientation is an important consideration in any building scheme. Sunlight within a building enhances colour and shape and helps to make a room bright and cheerful. Glare should be minimised and may be controlled by curtains or blinds. Solar gain can be mitigated by external screens or by architectural detail in the shape of windows and depths of reveals. (See Health Technical Memorandum (HTM 55) 'Windows'.)

3.6 A light and pleasant interior is required with an adequate level of illumination that can be varied to suit functional activities. Because natural lighting is variable in quality and quantity, the provision of a comprehensive artificial lighting installation is essential.

3.7 Adequate exterior night lighting is essential to ensure safety and security, enhanced by proximity sensors.

Ventilation

3.8 Natural ventilation should be provided throughout the accommodation by means of windows.

Internal spaces

3.9 Internal rooms may contribute to economy in planning, but the resulting continuous need for artificial lighting and mechanical ventilation will add to both capital and running costs. Internal spaces should be used only for activities of infrequent or intermittent occurrence or which demand a controlled environment.

Other environmental factors

3.10 Ambulance stations comprise two categories of accommodation which have distinct environmental requirements. These are the garage area, and the various staff and service premises, for example offices, changing rooms, rest-rooms and stores.

3.11 In the garage area, the general environmental aspects that need to be considered include ventilation and prevention of accidents and damage. The area must be adequately ventilated to release exhaust gases. Location of the building on the site can have an impact on the internal environment if the main garage entry and exit doors can be orientated with the prevailing wind.This will contribute to increased through ventilation and show a more rapid dissipation of vehicle

exhaust gases. Space heating is required to ensure that vehicles and their contents are kept in a state of operational readiness.

3.12 Exhaust fumes will blacken walls. Surface finishes should therefore be of a type that is easy to clean, and be provided to about 1.5 m in height. Floor screeds should be non-slip and impervious to grease and petrol. In order to facilitate cleaning it may be advisable to fix steel drip trays in the screed. The screed must be laid to fall towards channels or trapped gullies. Finishes should be durable, robust and easily cleanable.

3.13 Accommodation should be bright in appearance and comfortable to use, bearing in mind the special physical and psychological demands on the staff. The choice of floor coverings will depend upon local project options. Guidance on suitable flooring is available in HTM 61 – 'Flooring'.

Size, etc of ambulance station

3.14 Many factors must be considered when planning the size of each station (see paragraphs 2.2–2.9). Some standardisation of design is very desirable and each service may wish to prepare standard economical designs which can be adapted for each location.

3.15 The size of the station will depend not only on the number of vehicles to be based there (both immediately and in the long term to cope with planned NHS developments), but also whether vehicle maintenance and repair facilities are to be included and whether the communications centre and/or administrative headquarters are to be provided on site.

3.16 Because of the varying level of demand, it is not possible to devise norms or yardsticks to indicate the number of vehicle bays needed to serve a specific population.

3.17 The need to make a careful and accurate assessment of the amount of accommodation cannot be over stressed. The provision of too much accommodation can have just as serious an effect as the provision of too little, not only in terms of the additional capital expenditure, but also in respect of the long-term recurring costs of staffing and running the excess accommodation, diverting scarce resources from more pressing needs.

3.18 Many more women are now joining the ambulance service and this can have an effect on the facilities required in the staff accommodation.

Boiler plant

3.19 If the accommodation is to be located on an existing health authority development, it may be possible to augment existing boiler plant to supply the heating load. If not, a boiler house and appropriate fuel storage will be required to provide heating and hot water.

Boiler fuel storage

3.20 Where gas is not available or where local policy favours oil, solid fuel or liquified petroleum gas (LPG), three weeks' storage will be required. Generally, small oil storage tanks are rectangular and should be installed above ground, surrounded by an oil-tight bund wall. They may be located inside buildings in special tank chambers. Solid fuel should be stored in covered bays and located near the boiler. The method of delivery to site and handling facilities to the boiler should be considered.

Electrical switchcupboard

3.21 A special room is required to contain the incoming electrical supply with its distribution switchgear and fusegear. On sites where an electrical supply of suitable capacity is available from an existing switchboard nearby, a suitable local electrical switchgear compartment/cupboard may suffice. The space provided should be kept securely locked with an outward opening door. It must:

a. be permanently dry and well ventilated to disperse heat;

b. be kept exclusively for electrical purposes;

c. be large enough to permit equipment to be installed, operated and maintained safely and easily;

d. have good lighting for general purposes, and include 13 amp socket-outlets for hand lamps and power-operated tools.

External areas

3.22 Guidance on facilities in external areas such as roadways and car parking is given in HBN 45 – 'External works for health buildings' (1992).

Ambulance staff's duty room

3.23 This room is dealt with in HBN 51, Supplement 1 – 'Miscellaneous spaces in a District General Hospital'.

4.0 Ambulance station accommodation

Introduction

4.1 This chapter provides guidance on functional requirements and design implications for each of the activity spaces in an ambulance station.

Notice-boards

4.2 Notice-boards will be required and should be prominently located.

Entrance

4.3 The service's name board, illuminated at night, should be clearly displayed near the entrance to the ambulance station to ensure easy identification by ambulance crews and the public. The external door should be kept locked and should be unlocked only by staff, using either a key or appropriate security system. A method for use by the public to call staff is required.

4.4 The entrance hall will provide access to offices and staff areas and there should be clear signposting to the various parts of the station. A display panel for appropriate notices and a postal letterbox are required for ambulance requests sent by post or otherwise delivered.

4.5 A notice-board should be provided indicating the action to be taken to obtain ambulance assistance when the ambulance station is unmanned or is closed. It should be clearly visible to the public from outside by day or night.

Offices – general

4.6 Reference should be made to HBN 40 Volume 1 – 'Common activity spaces' for ergonomic information on office accommodation. The majority of ambulance stations will require two offices: one for staff organising the service operations, duties and movement of crews and vehicles; the other for the station officer responsible for overall administration and control of the station and staff. On stations with less than ten staff one office will generally be adequate.

Station office and service operations

4.7 The station office will be the centre of all station operations and will contain all necessary telecommunications equipment. Activities in this office will include the receipt and issue of telecommunication and other messages, the allocation of duties and movement of vehicles, the recording of staff attendances and the filing of service/station standing orders, Health and Safety regulations, daily records, statistics, etc. Any fuel dispensing control system should be operated from this room. Alarm bell activation will take place here. If there is no computerised fuel control system, it will be preferable for this office to be located so that it overlooks the fuel installations. The office should be located adjacent to the duty room and contain a sliding hatch to that room. One wall should be available for the resource allocation board. A desk, table, chairs and filing cabinet will be required.

Station officer's office

4.8 The station officer's office will be the administrative centre of an ambulance station. Activities within this office will include personal interviews with staff, disciplinary procedures and other meetings or interviews. Personnel records and station and vehicle inventories would normally be held here. Petty cash should be held in a suitable safe.

Duty room

4.9 This room provides an area where ambulance staff can wait while on call or resting during breaks in duty. Ideally, this should be adjacent to, or within easy reach of, the garage. To alleviate the possible tedium of waiting, good natural lighting and ventilation should be provided. The decor should be bright and the floor should be carpeted.

4.10 In smaller ambulance stations this room should also contain recreational facilities whereby staff can listen to the radio or play both active and passive games. Television viewing will normally take place in all duty rooms. Duty rooms may also be used for educational and training purposes. Medium and large stations should have a separate recreational area planned in association with the duty room.

Recreation area

4.11 A recreational area should be provided in medium or large ambulance stations where staff can rest, read, listen to the radio or undertake both active and passive games. This area should be planned with the duty room, but should have adequate separation from it. The decor should be bright and it should contain stacking chairs and tables. Any games equipment will be project specific. Recreation areas may also be used for education and training.

Seminar/training room

4.12 In larger stations and where regular training sessions are held, it may also be necessary to provide a seminar room in which conferences can be held, and have adequate storage facilities for training equipment. Appropriate sound attenuation will be required.

Kitchen/dining room

4.13 The kitchen/dining room should be open-plan with the dining area separated from the kitchen by a worktop. The kitchen needs appropriate equipment to enable staff to prepare meals, snacks and beverages for themselves. The facilities required include cooking equipment, a microwave oven, working surfaces, a sink and drainer, a refrigerator or fridge-freezer, together with cupboards and shelving. A constant-hot-water boiler should also be provided. Individual food lockers, suitably ventilated, may be provided for each member of staff. The dining area should be of adequate size to accommodate the maximum number of staff likely to be eating at any one time while on duty. If possible, this area should have windows; mechanical ventilation will be required in the kitchen area only.

Cleansing/laundry

4.14 The cleansing/laundry room is used for washing down and disinfecting all equipment. Floor and wall surfaces need to be easy to clean and disinfect. A hose point or a shower hose should be provided for washing down equipment over a floor gulley. Efficient ventilation is necessary.

Disposal room

4.15 A space in which general refuse can be held in sacks or bins pending removal is desirable. Used medical material can also be housed here in suitable containers. Efficient ventilation is necessary. This room could be combined with the dirty linen store.

Dirty linen store

4.16 A store for temporary holding of dirty or contaminated linen or clothes should be provided, located away from the clean linen store and other clean areas. Space should be provided for hampers, bins, etc awaiting laundry collection. Any bedding used for infectious cases or other contaminated material should be sealed in polythene bags before being placed in the appropriately colour-coded bins. Walls and floors should be of material which can be easily cleaned and disinfected. This store may be combined with the disposal room. Efficient ventilation will be required.

Lockers/changing/WC/showers

4.17 Separate locker and changing accommodation will be required for male and female staff. An appropriate number of WCs and hand-washing facilities should be provided, related to the maximum number of staff likely to be on duty at any one time. A WC suitable for use by disabled staff of either sex should also be provided, designed for easy access by wheelchairs. The minimum allowance is one WC and handwash basin for every eight staff on duty. A ventilated full-length locker should be provided for each member of the staff at the ambulance station, with adequate changing space for the number of staff likely to be using the accommodation at any one time. A shower is required in each male and female locker room. To make the best use of engineering services, the aim should be to locate all toilet facilities as near to each other as is practical.

Medical gas cylinder store

4.18 A suitable number of oxygen and oxygen/nitrous oxide cylinders should be located in a convenient "ready use store" or a "main cylinder storage area" (see Code of practice for the storage of medical, pathology and industrial gas cylinders). Reference should also be made to the guidance contained in HTM 2022[24]. The following are the principal features of a medical gas cylinder store:

a. it should be located on an external wall and be well ventilated at high and low level to a safe area away from air-conditioning intakes;

b. it should not be located in a basement;

c. internal walls and doors, provided for access from within the station, should be of two-hour fire resistance. Heat detectors may be required;

d. mixtures of oxygen/nitrous oxide are liable to separate at low temperatures, and therefore all cylinders should be kept horizontally at between 10°C and 80°C. Heating should be by indirect means, excessive surface temperatures should be avoided and natural ventilation should not be reduced;

e. it should be accessible to cylinder distribution vehicles and provided, where appropriate, with external doors for delivery and collection of cylinders;

f. it should be clearly labelled with the types of cylinders contained and "no smoking" warning signs;

g. cylinders should be stored in racks to BS1319;

h. cylinders should be used in rotation. Separate and clearly identifiable racks for full and empty cylinders should be provided;

j. natural ventilation should be provided by well-separated openings, equivalent to at least 1.5 per cent of the total area of the walls and roof.

Garage facilities

4.19 The system of garaging most convenient for ease of movement of vehicles is a one-way traffic system coupled with chevron parking, and with a central roadway. Site restrictions may, however, dictate the parking of vehicles at right angles to the central roadway. Provision is required for the use of high pressure portable washing equipment in allocated washing and cleaning areas – reference should be made to HSE Guidance Note PM 29[34]. Staff need reasonable access to toilet facilities in the garage area.

4.20 The garage should be a clear span structure with electrically operated doors on the accident and emergency bays to enable rapid movement by vehicles in and out of the parking bays. Vertically rising main doors usually allow a more air-tight design than those with horizontal movement and hence improve energy conservation. Vertical movement is also less susceptible to icing problems in severe weather. A small "wicket-door" will allow access without having to operate the main doors. The garage floor should have a non-slip finish when either wet or dry. It needs to be impervious to oil and chemicals, easy to clean and to slope to the central drainage system. The provision of drip-trays will facilitate floor cleaning and will give added protection to the drainage system. The walls should have an easily cleanable surface finish up to 1.5 m above finished floor level. Similarly, the floor and wall finishes in the wash bay should be easily cleanable and impervious to chemicals. High-level windows or roof-lights for natural lighting and a quick-response heating system are required.

4.21 Where the local policy is to heat the garage and where, due to the large volume of the building, excessive natural ventilation between changes of shift may lead to significant energy losses, a mechanical extract ventilation system should be installed for use when the main doors are closed.

4.22 The system should be designed to limit the concentration of residual exhaust and other gases to within the threshold limit values specified by the Health and Safety Executive; see Guidance Notes EH15 and EH33[18].

4.23 It should not be necessary for the extract system to run continuously between changes of shift, provided the time-switched purge period following each change of shift is sufficient to reduce gas pollution to within the specified limits.

4.24 The extract system may consist of a fan with back-draught shutters and should be time-switched to suit the unit's operational schedule. It should also have time-limited manual override.

4.25 The system should be interlocked to ensure that the heating and ventilation systems are inoperable while the main garage doors are open.

Mechanical vehicle-washing equipment

4.26 Where it is considered necessary to provide for mechanical vehicle washing, a separate space adjacent to the garage with access to the forecourt will be required. Normally, ambulance vehicle staff will operate the washing controls. The operator and controls should be separated from the actual washing areas by a protective viewing screen. The space should be planned to ensure that ambulances can be manoeuvred easily and safely into and out of the washing area.

4.27 Project teams should consider carefully the financial and operational implications of mechanical washing. The size and height of ambulances with projecting radio equipment etc make them susceptible to damage from mechanical washing equipment. The equipment itself will be out of action from time to time owing to breakdowns and servicing needs. Project teams may consider it is more efficient for vehicles to be washed down using high-pressure portable washing equipment. Specialised drainage (petrol trap) will be required in all vehicle washing areas, and electrical wiring and equipment will need to be protected from water.

Stores

4.28 Secure stores – in close proximity to the garage – will be required to house:

a. blankets, sheets, pillowcases, towels and any other linen;

b. medical supplies such as first aid dressings, bandages, splints, etc;

c. equipment for replenishing vehicles (trolleys, stretchers, etc), equipment belonging to dekitted vehicles, and any other equipment;

d. general expendable items;

e. documents, logbooks, files.

These stores may be separate or combined, as appropriate, for any project. Suitable shelving should be provided in the stores areas. The blanket store should be well ventilated and heated.

Cleaners' space

4.29 Provision is required for the storage of cleaning equipment and materials. There should be space for manoeuvring cleaning materials, emptying and filling of buckets and bowls, and routine servicing and cleaning of equipment. Consideration should be given to equipping this room with a Belfast sink system.

Vehicle fuel storage

4.30 Special precautions must be taken when storing fuel. Vehicle fuel may be petrol, diesel or liquified petroleum gas (LPG) depending on local policy. Bulk storage and dispensing facilities will be required if a local source is not available. Card- or key-operated pumps, monitored by computer, obviate the need for central control by ambulance staff to issue and record fuel, particularly if vehicles other than those of the ambulance service have access to the supply. Master controls should be operated from the supervisor's office.

4.31 The accommodation should be open and provide easy access and circulation for vehicles, including tankers. The hard standing should be level and impervious to fuel spillage. Planning should take into account safety and fire precautions, the number of vehicles using the facilities, grades of fuel, consumption of each grade, and the capacities and turning circles of tankers. The hard standing should be designed to prevent fuel entering drains or sewers. An oil/petrol interceptor will be needed. A canopy over the fuel pumps is necessary to protect personnel and documents in bad weather. A concrete base around the pumps will be needed which can accommodate a vehicle on either side of the pump.

4.32 It is usual to store petrol and diesel to the same standard, and while the minimum capacity may be 5000 litres, capacities of 20,000, 50,000 or 75,000 litres will be more economical. It is recommended that split underground storage tanks are used, for example, for a total requirement of 20,000 litres there should be two 10,000 litre tanks. Petrol tanks must be located underground, but diesel tanks may be located above ground. LPG storage tanks are normally installed above ground, but may be installed underground. They should not be installed in basements. Minimum separation distances from buildings/boundary of fixed source of ignition above or below ground are contained in HS(G)34[9].

4.33 All relevant statutory and local requirements should be followed when providing fuel storage tanks. The regulations governing underground storage are:

a. Petroleum Act 1987. Home Office 1968.[8]

b. Model code of principles of construction and licensing conditions. Home Office 1968.

c. Any conditions laid down by the local licensing authority.

Emergency electrical services

4.34 A three-hour non-maintained battery system for escape lighting on designated escape routes in accordance with BS5266 Part 1 is required.

5.0 Communication centre accommodation

Introduction

5.1 A communications centre for the receipt, registration, scheduling and recording of emergency and routine transport requests will be required. This should have sufficient space to enable radio control officers to be segregated from other aspects of the work, and to house equipment.

5.2 The number and type of functions carried out from a centre will be determined by the size and operational organisation of a particular service. The recommendations in this Note relate to a single central organisation covering the requirements for emergency and general ambulance services and the voluntary car service.

5.3 This chapter provides details of all the accommodation requirements for a communications centre. However, where it is located within a large ambulance station or the administrative headquarters of a particular service, it may be possible for some of the accommodation to be shared. Such aspects will need to be examined at the early planning stages of a project.

Function

5.4 The purpose of the centre is to receive all routine and emergency requests for the transporting of patients 24 hours a day. Control of all operational resources under the command of the ambulance service for the particular catchment area, for example, the deployment of resources to deal with single or large scale incidents of all types, will be from the centre.

5.5 The centre will also be responsible for:

a. the provision of advice and assistance to users of the service;

b. the maintenance of patients' movement records, statistical information and demand rates, the level of service provided, standards of service, maps and street indexes for the areas served, and any other necessary records, files or documentation;

c. the establishment of good working relationships with other emergency services or statutory authorities such as police, fire, hospitals and general medical practitioners.

Location

5.6 Ideally, the location of the centre should take into account the following factors:

a. easy access to the telecommunications network so as to make the best use of the public network in order to reduce the number of direct (private) and data lines required;

b. the need for a high level of security;

c. the need for adequate car parking space for staff and visitors.

Organisation

5.7 Staffing of the communications centre will be by male and female officers. More staff will be on duty during the daytime from Mondays to Fridays than at night and weekends.

5.8 There will be a number of ways in which the provision of the services of the centre can be organised. The recommendations in this Note, which are not intended to be restrictive, are based on an open-plan operations area, but subdivided, for:

a. the receipt of journey requests;

b. the planning and co-ordination of journeys booked in advance and their allocation to ambulance service or voluntary car service vehicles;

c. the receipt and despatch of vehicles.

5.9 These tasks require the maximum use of computerised procedures. An early assessment of suitable equipment is essential to enable space and electrical power requirements to be met.

5.10 Accommodation must also be provided for radio and other communications equipment, data processing equipment and the appropriate staff facilities.

Operations area

5.11 This is the operational area for command and control of the ambulance service and its additional communication responsibilities. It is used 24 hours a day and requires high-quality, durable furniture and fittings. The ergonomic design of work stations is critical to avoid reduced efficiency or increased stress because of the need to have immediate access to maximum data, indexes, lists of GPs, etc. Account

needs to be taken of the modern modular design of control console (for example work stations) which allows the operator easy access to radio, computer and telephone equipment from one position.

5.12 In order to avoid glare and problems of light reflected from control panels, VDTs and keyboards, special attention must be given to the correct illumination design for the whole installation. Further information on the subject of lighting VDT areas may be obtained from CIBSE Technical Memorandum TM6(1981).

5.13 Each centre requires separate work station facilities incorporating the National Emergency Reserve Radio Channel for provision of an immediate response to major incidents. The facilities should be located separately from the day-to-day activities in the operations room, in order that the two activities can function simultaneously.

5.14 A multi-track recorder for recording all incoming and outgoing telephone and radio messages will be required. It should be located near the emergency despatch point, so that access to information from it is readily available.

5.15 Special emphasis should be given to the importance of soft furnishings, for example curtains, carpeting and sound absorbing surfaces, in pastel colours. An adequate wall area is required for visual displays at the operational area and other specialised information. The wall clock should be of the digital variety.

5.16 It is essential that great care is taken in the design and layout of the floor. Equipment may need to be replaced during the lifespan of the operations room and initial planning can ensure that this is done with the minimum disruption to the continuous activities in the room. Lightweight modular access floor may be considered necessary by planners as this permits easy installation of trunking ensuring adequate clearance for cables, etc.

5.17 Staff in the operations area will be responsible for:

a. registration
   This involves handling, sorting and filing patients' transport requests for onward transmission to the planning department;

b. routine planning and scheduling
   This is the process of pre-planning advance bookings into journey programmes for each ambulance station or vehicle;

c. receipt and despatch of emergency requests
   These calls are received on the same day as transport is required, orders being issued direct to ambulance crews or other emergency assistance, mainly by radio or telephone. There is an operational need to monitor the progress of each call in order to ensure that adequate resources are available to meet any changes in demand;

d. community services
   For many ambulance services this involves the provision of a 24-hour answering service for other health service disciplines and the emergency bed bureau. Some NHS non-ambulance transport is also planned, co-ordinated and controlled by the ambulance service.

Not all of these duties are carried out on a 24-hour basis, and the separation of some areas into individual rooms, where possible, may reduce the need for special environmental requirements in other parts of it.

5.18 Reference should be made to the Good Practice Guidance, issued by Ambulance Professional Advisory Group (APAG).

Environment

5.19 It is essential that an even temperature and noise-free environment is provided 24 hours a day. Project teams will need to consider the provision of close environmental control and sound attenuation in the operations area. A communications centre requires maximum natural light without glare, and a pleasant outlook is desirable to alleviate the strain of continuous concentration.

5.20 A common problem for communications centres is high external noise levels. The operations room will require non-openable windows having appropriate sound attenuation and solar control characteristics. In order to maintain comfortable conditions with sealed windows, a mechanical ventilation system will be required. If equipment and solar heat gains are appreciable the supply air will need mechanical cooling. Soft floor finishes will assist sound attenuation. In operations and equipment rooms, floor finishes should be non-static in order to reduce electrostatic interference to communications. A light and pleasant interior, with adequate levels of natural and artificial lighting combined with control of direct or reflected glare, will contribute to staff comfort, particularly in those areas where VDTs and other equipment with electronic displays are installed. There should be adequate wall space for notice-boards and, in operational areas, sufficient additional space for large maps and charts. An emergency electricity supply must be available to ensure that the communications centre can remain fully operational in the event of a public electricity supply failure. For some communications and data processing equipment an uninterruptable power supply may be required. Static and humidity control should be considered.

Communication equipment room

5.21 Most ambulance services are utilising many high technology systems such as computers, fast printers, modems, etc for transmitting work to remote ambulance stations and hospitals. Whilst staff will work in this room from

time to time, occupancy will be mainly transitory, and the need for mechanical cooling can be minimised by careful specification of the equipment to be accommodated. The floor should also be a lightweight modular access floor to provide for underfloor ducting for the many power and communication cables which will extend between this room and the operations area. The lighting installation should ensure that adequate illumination is available for maintenance of equipment within racks and cabinets without compromising legibility of electronic displays. A small bench and power supply will be required for minor maintenance procedures.

5.22 The environment within the equipment room should be relatively clean and a windowless space is preferred. Staffing within the equipment room is transitory and there is therefore no functional requirement for comfort conditioning. However, the space will normally be subject to high equipment heat gains and some cooling may be required to maintain temperatures within the limits (currently 30°C) specified by equipment manufacturers. Self-contained DX package units, which can take advantage of "free" cooling and comprising an evaporator within the room and an external condenser, may be adequate. Alternatively, and to obviate the need for cooling, equipment should be specified to operate within a 40°C environment. The operations room will usually be double-glazed to reduce transmission of external noise. It is subject to equipment heat gains, and normal comfort conditions may not be achieved by mechanical ventilation without resorting to cooling as well.

5.23 However, the design team should evaluate for each of these spaces the need for, and the capital and revenue consequences of, cooling and its effect on reducing air change rates and annual heat consumption.

5.24 Plant capacity should be derived from outside design conditions, selected on the normal basis for commercial buildings, for example, local ambient enthalpy figures which may be exceeded for 30 hours per annum.

5.25 The fresh air supply should be treated and filtered before being distributed via high level diffusers with output profiles designed to avoid discomfort to the occupants – particularly where they are seated for relatively long periods. The supply plant should include air filters having a minimum arrestance of 85% when tested in accordance with BSEN 779[16]. In urban or other areas of high atmospheric pollution, a higher standard of filtration may be economically justified to reduce the level of staining to internal finishes. Filters must be readily accessible for replacement and maintenance purposes and provided with a pressure-differential indicator.

5.26 Partial recirculation of air should be incorporated as the primary method of achieving energy conservation. Heat exchangers are unlikely to be justified economically because of the low air volumes involved.

5.27 If air cooling is required, automatic controls should incorporate an economiser cycle to provide "free" cooling when outside air temperatures are lower than the required space temperature.

5.28 A plant room is unlikely to be economically justified for the relatively low capacity plant serving this area. Consideration should therefore be given to a packaged-type unit in a weatherproof enclosure installed on the roof.

Radio mast

5.29 A free-standing radio mast to take the aerial may be required on the site, unless the station is connected by a land line to a mast at a remote site. The height of the mast will be dependent upon the location of the centre. It must comply with local byelaws and any statutory requirements. The possibility of shared facilities with other services/utilities should not be overlooked. Consideration should be given to site security.

Entrance hall/reception/general office

5.30 The entrance hall and reception space should provide access to the offices and staff areas. Clear signposting to main parts of the centre should be provided. Within this area, a general office will provide the reception point for the centre, and space for staff undertaking general administrative duties. There should be a window opening to the general office. The external door should be kept locked; it should be opened only by staff using a key or appropriate security system. A speaking call or audio-visual device should be provided to give a better measure of controlled entrance and exit for staff at night and for general security. Control must be transferable to the operations room when the general office is not staffed.

Control manager's office

5.31 An office is required for the control manager in charge of the centre to undertake management and administrative duties, including interviews and meetings. The office should be adjacent to the main operations area. Facilities should be provided for a desk-mounted VDU and computer terminal.

Kitchen, dining and rest area

5.32 A combined kitchen, dining and rest area should be provided, the kitchen space being separated from the dining and rest areas by a suitable worktop. The kitchen requires appropriate equipment to enable staff to prepare meals, snacks and beverages for themselves. Cooking equipment should include a microwave oven, working surfaces, a sink and drainer, a refrigerator, a cupboard, shelves, and a

constant-hot-water boiler. Environmental health regulations must be met when deciding specifications.

5.33 The size of the dining and rest areas will depend upon local staff needs, bearing in mind that staff in the centre do not take meal breaks all at the same time. The duties of the centre's staff can be of a stressful nature and the environment of the dining and rest areas should take this into account. Bright, but restful, decor and full-floor carpeting are indicated.

Lockers/changing/WC/shower

5.34 Reference should be made to paragraphs 4.17 and 7.29.

Cleaners' space

5.35 Provision is required for the storage of cleaning equipment and materials. There should be space for manoeuvring cleaning materials, emptying and filling of buckets and bowls, and routine servicing and cleaning of equipment. There should be unrestricted access to the sink.

Document/archive store

5.36 Sufficient space is required for a document and stationery store, to meet local needs. This should include an archive area of sufficient size to meet the service's storage needs of hard copy and tape. Floor-standing racks and suitable stepladders will be required. A fireproof cupboard should be provided for storage of computer and audio back-up tapes. Consideration should be given in respect to Manual Handling Operation Regulation 1992.

Emergency electrical services

5.37 A plant room will be required to house a standby diesel generator to maintain electricity supplies to essential services. A separate flue and silencing system will be required for the exhaust gases, and other special precautions may be necessary to limit air and structural borne noise. The room may also be used to house the main electrical switchgear and the optional uninterruptable power supply plant. Diesel fuel storage, sufficient for seven days' running, is also required.

Boiler plant

5.38 If the accommodation is to be located on an existing health authority development, it may be possible to augment existing boiler plant to supply the heating load. If not, a boiler house and appropriate fuel storage will be required to provide heating and hot water.

Boiler fuel storage

5.39 Reference should be made to paragraph 3.20.

Electrical switch cupboard

5.40 Reference should be made to paragraph 3.21.

6.0 Training centre accommodation

Introduction

6.1 The centre is designed primarily for in-service training and should not be confused with a regional ambulance training centre. It represents the intermediate facility between a single training room at an ambulance station and the comprehensive specification of a regional centre.

6.2 The National Health Service Training Directorate (NHSTD) has reviewed the accommodation requirements for the approval of technician/paramedic training and has made non-prescriptive recommendations regarding buildings and equipment. Of overriding concern is the provision of high quality facilities, fit for intended purpose.

Function

6.3 To provide accommodation and facilities for both professional/technical development and supervisory/management training. It is anticipated that the primary user group will be clinically orientated.

Location/design

6.4 Practical considerations will, on occasions, hinder a complete freedom of site selection but the centre should be ideally located and designed to limit the intrusion of any form of distraction such as vehicle/traffic noise and personnel activity.

Entrance/reception/communication corridor

6.5 The organisation's sign/crest should be clearly visible, illuminated if necessary.

6.6 The entrance door should be security protected by key, card access or digital lock. The training manager/officer will be responsible for ensuring security.

6.7 The entrance hall will lead to a communication corridor which will provide access to offices, teaching areas and utility areas. All should be clearly signposted.

6.8 A reception area should include a seating area to accommodate visitors to the centre.

6.9 Soft floor finishes will assist sound attenuation. The decorative features should be bright and welcoming. Provision of 13 amp sockets will assist the cleaning of this area.

Offices – general

6.10 Reference should be made to HBN 40 – Volume 1.

6.11 In addition, consideration should be given to a discrete student counselling area, within the overall office space, equipped with easy chairs to create a more interactive ambience. Facilities should include workstations for PCs, desk, chairs, whiteboards and built-in filing facilities.

Plenary room

6.12 This room will be used for lecture style presentations and general group activity. The room should be well ventilated, have a light and pleasant interior and adequate levels of natural and artificial lighting.

6.13 Consideration should be given to the provision of features such as a "teaching wall" (audio visual equipment); blinds/screens will assist in the use of these visual aids (OHP – 35mm slide).

6.14 The room should be equipped with multi-power points and computer links to mainframe computers (where appropriate).

Syndicate rooms

6.15 Two smaller rooms, adjacent to the plenary room, should be provided for syndicate teaching.

6.16 The room should be carpeted and be of bright and pleasant decoration. Appropriate sound attenuation will be required.

6.17 Facilities should include whiteboard, flipcharts and blinds.

6.18 Multi-power points are essential and computer links advantageous.

Clinical room

6.19 This area is reserved for clinical skills practice in:

a. cardio-pulmonary resuscitation;

b. endotracheal intubation;

c. intravenous infusion;

d. defibrillation and advance cardiac life support procedures.

6.20 As this is a dedicated area, training manikins can be left in-situ, primed where appropriate for skills teaching/ practice.

6.21 Facilities should include hot and cold water supply, sinks, work surfaces, unit cupboards and multi-power points of a waterproof specification.

6.22 Walls, floors and units should be readily washable and sharp edges on units reduced to a minimum. Consideration should be given to unit configuration in order to promote maximum effective working area.

Stores

6.23 A secure store of appropriate size equipped with suitable shelving is required to house:

a. prescription-only medicines cabinet;

b. ambulance equipment;

c. training manikins;

d. visual aids;

e. linen;

f. expendable items of stock.

6.24 The area should have good lighting and 13 amp socket-outlets for battery charging.

6.25 The floor surface should be durable and washable.

Medical gas store

6.26 Small-scale version of ambulance station specification (see paragraph 4.18).

Cleaners' cupboard

6.27 A dedicated area for the storage of cleaning equipment and material. There should be space to manoeuvre equipment and unrestricted access to a sink.

6.28 The floor should be durable and readily washable.

Toilets/cloakroom

6.29 Separate toilet facilities should be provided for male and female staff.

6.30 An appropriate number of WCs and handwashing facilities should be provided related to the maximum number of staff likely to use the centre. Building regulations advise.

6.31 To make optimum use of engineering services, the aim should be to locate all toilet facilities in as close proximity as is reasonably practicable.

6.32 An area should be reserved for coats, hats, etc.

Recreation/coffee area

6.33 Students should be provided a common area to relax and take refreshment. This area should be conveniently located to the teaching area but not so close as to permit disturbance to other ongoing training activity.

6.34 The area should be decoratively bright and well ventilated and the floor should be carpeted in the main.

6.35 The use of a drinks dispenser is a convenient means of supplying refreshments. It is recommended that the floor area occupied by such dispensers is of a vinyl fabric to ease the cleaning of inevitable spillage.

6.36 Soft furnishings should include easy chairs and a coffee table.

Plant room

6.37 If the centre is not serviced from a primary building it will require its own plant room for engineering and electrical services.

6.38 The room should be large enough to permit equipment to be installed, operated and maintained safely. It should be well ventilated, dry and have good lighting. Ideally, there should be a 13 amp socket-outlet for hand lamps and power operated tools.

Furniture/fitting – general

6.39 All equipment should be of good quality with commercial standards of wear and tear.

6.40 Chair protection rails should be provided in all teaching/public areas.

7.0 Workshop accommodation

Introduction

7.1 This chapter outlines the requirements for workshops associated with ambulance services, and describes the design features to be considered.

7.2 The project team should assess the need for a workshop – either located within the curtilage of an ambulance station, or elsewhere – for the repair and maintenance of vehicles.

7.3 The size of any workshop accommodation will depend on the service's overall policy on this matter, particularly having regard to:

- the catchment area to be covered;
- whether maintenance and repairs are to be limited to ambulance service vehicles or extended to include other NHS vehicles;
- the range and size of vehicles to be accommodated, and the extent of repairs to be undertaken;
- whether any routine maintenance and minor repairs are to be undertaken at individual ambulance stations;
- the servicing of ambulance stations with no workshop or maintenance facilities;
- the use of external commercial facilities for some or all maintenance and repairs.

7.4 All these factors should be considered very carefully and financial viability assessed for all options. It is important that the facilities provided are used to the fullest extent possible, including maintenance and repair of non-ambulance service vehicles. In order to provide a base for assessing requirements, the guidance given in this Note will relate to the provision necessary in a purpose-built workshop for dealing with most repairs and maintenance to ambulance service vehicles up to a maximum weight of 4 tonnes. This will not preclude the facilities being used to maintain and repair non-NHS vehicles, for which appropriate charges should be made on a commercial basis.

7.5 Workshop size will depend upon local circumstances. In some cases, the workshop will serve solely the requirements of the ambulance service over the whole, or part, of a particular service's catchment area. In other cases, dependent on the service's local transport policy, the workshop may be required to cater for non-ambulance vehicles. These factors will, of course, be of major significance in deciding the size of the workshop and in determining its equipment requirements. It is not practicable here to describe the design features for the whole range of facilities which might be needed to serve a total transport fleet. This chapter therefore deals with workshops able to cater for maintenance and repair of vehicles up to the light goods range (for example, approximately 4 tonnes). The design features described in this chapter are not suitable for workshops dealing with larger vehicles, although the basic principles it sets out would nevertheless apply.

7.6 Where a workshop is on the same site as an ambulance station there should be scope for sharing some facilities, and attention is drawn to these where appropriate. The workshop itself should, however, have separate access and egress.

7.7 When considering sites for the workshop, one of the main factors to be taken into account is ease of driving access for those ambulances which will need to use the workshop. Due regard should be given to the level of demand and this should be associated with geographical constraints, road network, traffic routes, level crossings, limited access/egress from major roads, dual carriageways etc. The relationship of one site to another, particularly in conurbations having a network of main and sub-workshops, should be carefully analysed to ensure that adequate back-up is available during peak periods of demand.

Design aspects

7.8 All facilities must fully comply with the Health and Safety at Work etc Act and Regulations. Where MOT testing is undertaken, details of statutory requirements are given in:

a. The Motor Vehicles (Tests) Regulations 1981;

b. The MOT testing guide. Vehicle Inspection Executive Agency, 1992 (available from HMSO);

c. The MOT inspection manual: car and light commercial vehicle testing: including explanatory notes on the statutory provisions and regulations for testing the above vehicles, under Section 45 of the Road Traffic Act 1988.

7.9 Location sign-boards are essential. They should be sited in prominent positions clearly visible from approach roads, to aid drivers who may not be familiar with the district.

7.10 Workshops will contain a considerable amount of highly specialised equipment and it is essential to ensure that expert advice on all aspects of design and layout is available throughout the project. The chief ambulance officer and the fleet engineer must therefore be involved with the project from its earliest stages of development. The overall accommodation should have a high level of natural and

artificial lighting. Floors must be capable of withstanding the weight of activities undertaken in each area.

7.11 The workshop area will require a well-drained forecourt with adequate parking space for ambulances awaiting repair or collection, and for employees' cars. It is necessary to ensure that separate premises are adequately secured by a surrounding wall or strong fence.

7.12 Guidance is not provided in this document for a store to house industrial gases as it is assumed that gas cylinders will be obtained as required on an immediate exchange basis. If it is necessary to hold full cylinders of oxygen and acetylene for a short period, the cylinders should be six metres apart or separated by a wall.

Function

7.13 This Note relates to guidance for two sizes of workshop for the servicing and repair of ambulance service vehicles. The first size is a three-bay workshop accommodating the following activities:

a. routine inspection and servicing;

b. minor mechanical and electrical repairs and exchange of assemblies;

c. minor bodywork repairs and associated brush painting;

d. preparation for MOT testing.

7.14 The second size is a five-bay workshop and this provides facilities for:

a. routine inspection and servicing;

b. major mechanical repairs including overhauls of major assemblies and electrical repairs;

c. minor body repairs and associated brush painting;

d. MOT preparation and testing.

7.15 The outline above gives only broad areas of work and is not intended to be restrictive. The accommodation provided should be effectively used to maximum capacity and may also be used to service or repair NHS vehicles other than ambulances in accordance with any locally agreed policies. However, if larger vehicles than those usually found in the ambulance service are to be accommodated in these workshops, additional facilities may be required. A broad reference to the additional facilities which may be needed is given in paragraphs 7.36 to 7.38 but detailed guidance is not provided.

Office

7.16 A small office will be required for administrative work in connection with vehicle servicing and repair activities. The office should overlook the workshop work areas and adjoin the general store.

7.17 If the workshop is on an ambulance or hospital site there may be scope for the use of a computer terminal associated with any computer services provided in the ambulance station or hospital. Project teams will need to consider this matter at an early stage (see paragraph 8.24).

Stores

7.18 The ventilated store should hold spare parts, tyres, exhaust systems, tools and equipment for use in the workshop. The store for the three-bay workshop should also hold any spare vehicle batteries. Where there is a need to hold small quantities of spirits, these should be stored in a fireproof cupboard (see HTM 83). Exchange of clean and dirty overalls will also take place in the store. There should be easy access to the work bays and the office.

7.19 The store will require adequate deep racking, free-standing racked metal storage bins, a rack to hold exhaust pipes and a wallboard for hanging gaskets. A metal worktop for sorting out materials and a card system for recording stores will be needed.

Workshop

7.20 The main repair and servicing work will be undertaken in the bays of the actual workshop space. The design and layout of the workshop must therefore ensure that all activities can be undertaken easily and efficiently and that working procedures can flow properly without undue inconvenience to the working mechanics. There must be adequate space to manoeuvre vehicles in and out of the working areas and bays.

7.21 The main difference between the three- and five-bay workshops will be the quantity of equipment required to meet the workloads and the number of mechanics likely to be employed. The three-bay workshop will require two hoists and the five-bay workshop, three hoists – one of which may be involved with MOT testing. The hoists should be capable of lifting the vehicles likely to be maintained and there must be adequate height for them. Fixed and portable benches will be needed. Each bay will require some type of fume extraction for safety purposes. Suggested lists of fixed and mobile equipment for the workshops are given in the relevant activity data A-Sheets, see Chapter 11. These lists give an indication of the extent of equipment likely to be required for each size of workshop. They are not intended to be exhaustive or restrictive, and should be used by project teams

merely as a basis for assessing the requirements of individual projects.

7.22 The workshop will require a high level of illumination, and a suitable form of heating to cope with the large volume of space and the large doors. The floor needs to be capable of withstanding damage from heavy impact and the effects of oil and chemical spillage. If possible, the main doors should not face the prevailing wind direction. There should be adequate space to store equipment in use and to move items around the workshop. Items should be easily accessible and well labelled. To avoid the hazard of lengthy cables trailing across the floor, adequate socket-outlets should be available. First aid facilities should be placed in a conspicuous and easily accessible position. Consideration should be given to overhead supply systems for oil, gas, etc.

7.23 The forecourt to the workshop area should have a level approach to the external doors. It should be well drained away from the doors. There should be adequate space within the forecourt to manoeuvre and park a number of vehicles.

Ventilation

7.24 A vehicle exhaust extract system, using flexible hose connections to each vehicle bay, will be required in the workshop and in the garage minor maintenance bay.

7.25 Workshop areas should have a mechanical extract system. Vehicle maintenance areas have special ventilation requirements.

Oil store

7.26 The oil store should be adjacent to the workshop. Clean and waste oil should be stored within this space and suitable provision made to contain any spillage. Clean oil will be piped to the lubrication bay by suitable equipment and waste oil should be routed into the waste oil container from the workshop area. Tanks should be adjacent to an outside wall so that clean oil can be pumped into the tank and waste oil extracted. Double doors with direct access to the outside are required for the removal of tanks and containers. Other oils and antifreeze required for use in the workshop can be stored here in small containers. The clean and waste oil tank capacities should be about 2275 litres (500 gallons). Doors and walls should be of the necessary fire resistance.

Pantry/kitchen/dining/rest-room

7.27 The kitchen/dining/rest-room should be open plan, with the dining/rest-room area separated from the kitchen by a worktop. The kitchen needs appropriate equipment to enable staff to prepare meals, snacks and beverages for themselves. The facilities required include cooking equipment, a microwave oven, working surfaces, a sink and drainer, a refrigerator, and cupboards and shelving. Individual food lockers, suitably ventilated, are recommended for each member of staff.

7.28 The dining/rest-room area should be of adequate size to accommodate the maximum number of staff likely to be eating at any one time. This area should have windows and mechanical ventilation.

Lockers/changing/WC/showers

7.29 A changing room will be required with shower and WCs. A locker should be provided for each mechanic. Work conditions and standards as laid down in the Offices, Shops and Railway Premises Act 1963 should be observed. Reference should also be made to Health Building Note 41 – 'Accommodation for staff changing and storage of uniforms'. Where female staff are employed, separate locker, changing and WC facilities will be required.

Steam-cleaning and rust-proofing

7.30 Where local policies provide that steam-cleaning and rust-proofing should be undertaken, a separate space adjacent to the main workshop should be provided. It should contain a bay with a hoist to enable vehicles to be prepared for steam-cleaning, and to be rust-proofed or undersealed with specialist equipment for these purposes. A sludge sump and adequate drainage will be necessary. Where rust-proofing is undertaken, good ventilation is necessary. The steam cleaning bay is a project option.

Boiler plant

7.31 The provision of a boiler plant (see also paragraph 3.19) for heating and domestic hot water will depend upon the siting of the workshop premises. If the workshop is located within or adjacent to an ambulance station or on a health authority site, it may be possible to augment or use the boiler facilities already available. If this is not possible, space will be required to house the boiler plant. Compressed-air plant may also be accommodated here.

Boiler fuel storage

7.32 Where gas is not available or where local policy favours oil, solid fuel or liquified petroleum gas (LPG), three weeks' storage will be required. Generally, small oil storage tanks are rectangular and should be installed above ground, surrounded by an oil-tight bund wall. They may be located inside buildings in special tank chambers. Solid fuel should be stored in covered bays and located near the boiler. The method of delivery to site and handling facilities to the boiler should be considered.

Electrical switch cupboard

7.33 A special room is required to contain the incoming electrical supply with its distribution switchgear and fusegear. On sites where an electrical supply of suitable capacity is available from an existing switchboard nearby, a suitable local electrical switchgear compartment/cupboard may suffice. The space provided should be kept securely locked with an outward opening door. It must:

a. be permanently dry and well ventilated to disperse heat;

b. be kept exclusively for electrical purposes:

c. be large enough to permit equipment to be installed, operated and maintained safely and easily;

d. have good lighting for general purposes, and include 13 amp socket-outlets for hand lamps and power-operated tools.

Emergency electrical services

7.34 A three-hour non-maintained battery system for escape lighting on designated escape routes in accordance with BS5266 Part 1 is required.

Industrial compressed air

7.35 Compressed air outlets with instantaneous connectors will be required for pneumatic tools in the workshop. Further information, including sizing and system design, is contained in Engineering Data Sheet DT1[25]. Where compressed air is required only for tyre inflation, a portable compressor will be adequate. Consideration should be given to providing a standby generator for use when the main unit fails or requires servicing.

Additional facilities

7.36 The detailed guidance on workshops covers those in which the scale of work is as indicated in paragraphs 7.20 to 7.23. Where local policies require different standards of work to be carried out and/or other types of vehicles to be repaired and serviced, additional space and equipment will be required.

7.37 If it is decided to service and repair non-ambulance vehicles and/or to carry out major body repairs and paint spraying, depending on the scope of the extra workload, the additional facilities which will need to be considered are:

a. more bays and hoists;

b. hoists capable of lifting loads heavier than 4 tonnes;

c. more space and greater heights to accommodate vehicles larger than the normal run of those in the ambulance service;

d. equipment necessary to carry out major mechanical analysis, testing and repair;

e. some form of partial separation between body and mechanical repair shops;

f. a machine shop and metalwork area;

g. shop-floor racking for timber, metal bars, sheet metal and glass reinforced plastics;

h. fixed posts and rings for body straightening;

j. one or more fully-equipped paint spray booths with appropriate strict safety precautions;

k. a paint preparation bay with dust extraction facilities;

m. a paint store.

7.38 Some additional items of equipment are:

- hydraulic body-straightening pack;
- mechanical saw;
- guillotine;
- metal-bending machine;
- bandsaw;
- wood-planing machine;
- paint spray equipment;
- localised paint dryer.

8.0 Environmental and other topics

Introduction

8.1 This chapter contains additional guidance on aspects of function and design which are common to health buildings generally, and which will need to be borne in mind when designing new buildings or upgrading existing premises.

Statutory and other requirements – including Crown immunities

8.2 HC(88)60 HC(FP)(88)29 (in Wales, WHC(89)20) advises services that their building schemes should comply with the requirements of building legislation, even where these are not legally enforceable against authorities, and with all other relevant codes of practice standards. It also requires authorities to ensure they have adequate procedures to ensure compliance. Attention is also drawn to HSG(92)35, 'Pest control management for the Health Service', and HC(87)3 (in Wales, WH (87)8) concerning 'Health and safety at work: Crown immunity'. These give the practical implications of the change in the law on Crown immunity. HN(90)27 gives guidance to health authorities on the implications on the removal of Crown immunity. This Note takes account as far as possible of all statutory and other requirements currently in force, but health authorities are reminded of their responsibility for ensuring compliance with statutes, regulations, codes and standards.

Economy

8.3 Health buildings should not only satisfy functional requirements, but should also be economical in respect of both capital and running costs. Due weight must therefore be given to problems of space provision, maintenance, cleaning, energy consumption and staffing requirements. Planning should ensure that spaces are used as intensively as possible and are not unnecessarily duplicated.

8.4 To ensure that there is not over-provision of new accommodation, project teams should first evaluate the utilisation of similar existing facilities with a comparable workload and staffing.

Upgrading or adaptation of existing buildings

8.5 The standards set out in this guidance essentially apply to the provision of accommodation by new building, and it is not intended that they should be applied retrospectively to existing stock. However, the principles are equally valid and should be applied, so far as is reasonably practicable, when existing accommodation is being upgraded or new accommodation is being constructed within an existing building which may previously have been used for other purposes.

8.6 The cost of upgrading work should conform to the guidelines indicated in the Department's WKO letter (81)4 (in Wales, AWO(81)8). These guidelines take into consideration the estimated life of the existing building and the difference in cost between upgrading a building and providing a new building.

8.7 Before deciding to upgrade, the long-term strategy for the service, the space required for the new service, and the size of the existing building should all be considered and reconciled. The orientation and aspect of the building should be considered and the adequacy of the necessary support services ensured. If there emerges a *prima facie* case for upgrading, a thorough analysis of all functional and physical conditions of the existing building should be undertaken.

8.8 When comparing the cost of upgrading or adapting an existing building with that of new building, due allowance in addition to building costs must be made for:

a. relocating people;

b. demolition and salvage costs;

c. the disruption of services in a phased project;

d. the temporary effects on running costs of any impaired functioning of adjacent areas.

8.9 The check of physical and other aspects of existing buildings should include:

- availability of space for alterations and additions;
- type of construction;
- physical constraints such as load-bearing walls and columns;
- insulation;
- age of the buildings and condition of the fabric, for example, external and internal walls, floors, roofs, doors and windows;
- life expectancy and adequacy of engineering services, ease of access and facility for installation of new wiring and pipework;

- the height of ceilings; high ceilings do not necessarily call for the installation of false ceilings, which are costly and often impair natural ventilation;
- changes of floor levels to avoid hazards to disabled people;
- fire precautions.

8.10 Having decided that existing premises are suitable for upgrading or conversion, the main requirement will be to assess how best the accommodation can be adapted so as to facilitate good practice. The main environmental factors which should be considered are the same as for new building.

8.11 This summary of the main aspects of upgrading is general in character, as it is recognised that each upgrading project will present its own individual problems. In many instances compromises may have to be reached between Health Building Note standards and what it is possible to achieve. Upgrading should be functionally sound – not merely cosmetic – and appropriate for the projected needs of patients and staff.

Fire precautions

8.12 Structural fire precautions and means of escape must be considered at an early stage. The combination of offices, garaging, workshops, and petroleum dispensing facilities is potentially hazardous, and their relationship needs to be carefully considered. The lead authority for all new building work (including upgrading work) is the Building Regulations, and other matters, including the local fire authorities' requirements, should be channelled through them. It is essential that building control authorities are consulted from inception to completion of a project.

8.13 All building work should comply with the requirements of the Building Regulations 1991 (SI 1991 2768). Approval should be obtained from the building control authority or approval inspector. Procedural guidance is available in the document 'Building Regulations and fire safety guidance' issued jointly by the Department of the Environment, the Home Office and the Welsh Office.

8.14 NHS Estates' 'Firecode' gives guidance on fire safety in NHS premises. Although generally written for healthcare premises, the guidance in 'Policy and Principles', and HTM 83 'General fire precautions' is applicable to accommodation for ambulance services.

8.15 The principles of fire safety apply equally to new projects and to alterations and upgrading of existing buildings.

Non-smoking

8.16 Health Circular HC(85)22 dated May 1985 (in Wales, WHC(85)31 dated June 1985) reviews the problems presented by smoking in health buildings, and, while recognising that the responsibility for determining local policies rests with the employing authority, recommends that smoking be restricted to specially designated areas which are clearly signposted. In such areas ventilation should be sufficient to prevent discomfort to non-smokers and the spread of odours to other areas of the premises.

Critical dimensions

8.17 Information on critical dimensions for some of the activities mentioned in this Note is included in HBN 40 – 'Common activity spaces'.

Signposting

8.18 A location sign-board is essential. It must be in a prominent position, clearly visible from the road and should be illuminated at night. HTM 65 – 'Signs' should be consulted for general guidance.

Maintenance and cleaning

8.19 The design, layout and construction of ambulance stations, communications centres and workshops should incorporate all facilities necessary to ensure high standards of cleanliness for staff, vehicles and equipment, and the premises.

8.20 Materials and finishes should be selected to minimise maintenance and be compatible with their intended function. Building elements that require frequent redecoration, or are difficult to service or clean, should be avoided. Special design consideration should be given to elements such as entrances, corners, partitions, counters and any others which may be subjected to heavy use. Floor finishes should be restricted in variety and, where soft floor coverings are specified and spillage is anticipated, should have a backing impervious to fluids and non-absorbent pile. Wall coverings should be chosen with ease of cleaning in mind.

8.21 Health Technical Memoranda 56, 58 and 61 give guidance on these aspects for partitions, internal door sets and flooring.

Information technology in the NHS: provision for automatic data processing (ADP)

8.22 Computers, which make possible the automatic processing of much ambulance scheduling and recording data, are being used by a number of services, and it is reasonable to expect that they will, in the future, be employed increasingly for a range of ambulance service operational activities. The implications for building project teams are threefold:

a. housing of the computer(s);

b. provision of ducts for transmission cabling;

c. provision for modems, visual display units and printers.

Even if the introduction of ADP is not proposed at the time that the project team completes its report, it will be advisable to design in such a way that equipment can be introduced easily and quickly at some later date. The project team should assure themselves that appropriate wire-ways and adequate and secure power supplies are provided in those spaces where computer terminals may be installed.

8.23 There are two principal matters of concern – visibility and noise. Visual display units (VDUs) are now a familiar sight and it will easily be appreciated that they cannot be reduced beyond a certain size. Consequently, sufficient and convenient space must be provided for them. Also, since the brightness of the letters displayed on the screen cannot exceed a certain limit, special attention must be given to the ambient lighting to ensure that the contents of the screen are legible. Space will be required in front of the screen for a keyboard. The problem of noise arises from the method of obtaining data from the computer, namely by different varieties of printer which can provide printed paper copies of the data in the computer. Much has been done to reduce noise and the latest laser printers work reasonably silently. Ambulance communications centre personnel are particularly susceptible to noise – they are constantly taking and making calls over radio and telephone; but they must also have access to any computer scheduling facilities on hand. It is important that the requirements of communications centre staff are taken into account at an early stage in planning the siting of equipment, such as the positioning of the printer room in relation to the staff rest area.

8.24 Computing expertise is now widely available in the NHS, and project teams should ensure at an early stage that they inform themselves concerning the current and projected local computing policies, and that their proposals conform with them.

Component data

8.25 The component database consists of a series of Health Technical Memoranda (HTMs) which provide specifications and design guidance on building components for health buildings which are not adequately covered by current British Standards. No firms or products are now listed. (See the Bibliography for a list of relevant HTMs.)

People with disabilities

8.26 It is essential to ensure that suitable access and facilities are provided for people with disabilities who have problems of mobility or orientation. This includes, besides the wheelchair-bound, those who for any reason have difficulty in walking and those with a sensory handicap such as visual or hearing impairment. Services are reminded of the need to comply with the provisions of the Chronically Sick and Disabled Persons Act 1970 as amended by the Chronically Sick and Disabled Persons (Amendment) Act 1976, the Disabled Persons Act 1981, and the Building (Disabled People) Regulations 1987, Part M, Schedule 1. Attention is also drawn to BS5810: 1979 'Code of practice for access for the disabled to buildings', correct as of October 1993. One of the effects of the 1981 Act is to apply this British Standard to premises covered by the 1970 Act, which includes those open to the public. Compliance with the British Standard will also meet the "deemed to satisfy" provisions of Schedule 1 of the Building Regulations 1987 in terms of design.

8.27 Project teams are encouraged to refer to HBN 40 – 'Common activity spaces' Volume 4 'Designing for disabled people'. This gives guidance and a set of ergonomic data sheets on access, space and equipment relating to disabled people in health buildings.

9.0 Engineering services

Introduction

9.1 This chapter describes the engineering services contained within an ambulance station, workshop and communications centre. These three buildings may be located together or separately, on or off a hospital site. The guidance should not inhibit the design solution, but will acquaint the engineering members of the multidisciplinary design team with the design criteria and material specification needed to meet the functional requirements.

9.2 Documents referred to by number, for example[10], are listed. Each repeated reference retains the same number.

GENERAL

Model specifications

9.3 A series of model specifications, for the specialised engineering services in healthcare buildings, has been issued and is sufficiently flexible to reflect local needs. The cost allowance is based on the qualities of material and workmanship described in the relevant parts of the model specifications.

Economy

9.4 Engineering services are a significant proportion of the capital cost and a continuing charge on revenue budgets. The project design engineer should ensure:

a. economy in initial provision, consistent with meeting the functional requirements;

b. optimum benefit from the total financial resources these services are likely to absorb during their lifetime.

9.5 Where alternative design solutions are available, their consequential capital and running costs should be compared using option appraisal techniques (see HN(87)18 Health building procedures[1]). In this way due consideration is given to the need for, and cost of, maintenance and the eventual replacement of plant and equipment.

9.6 Heat conversion and distribution losses can be significant where buildings are located on a hospital site but remote from the energy centre. The economic appraisal of alternative locations and design solutions should take this factor into account.

9.7 In any new project, consideration should be given to energy management and facilities offered by a site monitoring system to enable some measure of energy accounting to be exercised at user level.

9.8 After satisfying the Building Regulations 1991[2] on the standards of thermal insulation provided, the design team should consider the economics of additional insulation.

9.9 In view of the increasing cost of energy, the project team should consider the economic viability of heat recovery from mechanical ventilation systems. Designers should also ensure that those services which use energy do so efficiently.

Maximum demands

9.10 User demand on engineering services is often difficult to predict, but experience indicates that services designed for simultaneous peak conditions are seldom fully utilised in practice. The estimated maximum demand, and storage requirement (where appropriate), for each engineering service in this accommodation, will need to be assessed individually to take account of the size, shape, function, geographical location, operational policies and intensity of use of the building. As a guide and for preliminary planning purposes only, the following are the estimated maximum demands for a 16-vehicle station, five-bay workshop and communications centre.

Service		Ambulance station (16-vehicle)	Workshop (5-bay)	Communi-cation
Heating (inc ventilation and HWS)	kW	78	66	32
Cooling	kW	–	–	3.5
Domestic HWS storage (2 hour recovery)	*l*/s	0.64	0.37	0.51
	l	700	105	600
Ventilation (supply)	m^3/s	–	–	0.3
Ventilation (extract)	m^3/s	3.5	0.147	0.4
Cold water supply	*l*/s	0.71	2.38	0.54
CWS storage (24 hours)	l	5000	1820	3640
Lighting and power (inc essential)	kVA	33	31	49
Compressed air capacity	*l*/min	300	300	–
pressure	bar	7–8	7–8	–

Space requirement for services

9.11 Space for plant and services is important and the layout should provide:

a. easy and safe means of access, protected as far as possible from unauthorised entry;

b. space for frequent inspections and maintenance;

c. means of eventual removal and replacement of plant.

9.12 Recommended spatial requirements for mechanical, electrical and public health engineering services are given in HTM 23[3]. The information in this publication is specifically intended for use during the initial planning stages when precise dimensional details of plant are not available.

9.13 Except in the garage and workshop areas where a surface installation is acceptable, the distribution of mechanical and electrical services to final points of use should, wherever possible, be concealed in walls and above ceilings. Heat emitters in administrative and amenity areas should be contained within a 200 mm wide perimeter zone under windowsills, and critical dimensions should be taken from the boundary of this zone. For costing purposes, the 200 mm zone, which includes the floor area occupied by minor vertical engineering ducts, is included in the building circulation provision.

Activity data

9.14 Functional requirements, environmental data and equipment details are described in the activity data sheets (listed in Chapter 11) and should be referred to when positioning service components and outlets.

Safety

9.15 Section 6 of the Health and Safety at Work etc Act 1974[4], as amended by Schedule 3 of the Consumer Protection Act 1987[5], imposes statutory duties on all persons who design, manufacture, import, supply, install or erect "articles for use at work". One of the requirements of this section is to ensure, so far as is reasonably practicable, that the article is designed and constructed so that it will be safe and without risk to health at all times when it is being set, used, cleaned or maintained by a person at work. All parts of engineering systems are covered by the term "articles for use at work".

Fire safety

9.16 Guidance concerning the requirements for fire safety in NHS premises is contained in the suite of documents published under the general heading of Firecode which includes HTM 81 and other HTMs in the "80" series.

9.17 The design should accord with the HTM 80 series, and the engineer should verify his proposals in accordance with the procedure described in paragraphs 8.13–8.17 in this Note.

9.18 Installations for the storage of flammable liquids should be in accordance with the recommendations in Fire Practice Note No 2[6] and HSE Guidance Note HS(G)(50)[7]. Storage of petrol is regulated by the Petroleum Act 1987[8]. Health authorities are not exempted from obtaining a licence and arrangements for the storage of petrol should comply with the Act's model code of practice and the requirements of the local licensing authority (county council or fire); see also paragraphs 4.30–4.33.

9.19 Where the garage is to be used for parking and maintaining vehicles fuelled by liquified petroleum gas (LPG) the design should comply with the requirements contained in HS(G)34[9]. The design and construction of plant and equipment for storage and handling of LPG should be in accordance with HS(G)34[9].

9.20 Luminaires and other electrical equipment installed in hazardous areas must comply with the requirements described in paragraph 9.72.

9.21 All practicable steps must be taken to ensure that no flame, spark or smoking can occur in locations where petrol or LPG is stored and dispensed.

9.22 An adequate number of fire extinguishers (foam or powder for petroleum spirits, and powder only for LPG) and a supply of dry sand, with means of application, should be located where these fuels are stored, handled or exposed. Elsewhere, fire extinguisher provision should be in accordance with HTM 81.

9.23 For fuel dispensing installations, a master control switch (fireman's switch) is required to isolate the electrical supplies to all pumps and associated lighting circuits. It should be installed in an accessible position but outside the hazardous area.

9.24 Automatic fire detection will be required in garage and workshop areas where they have staff accommodation or a communication centre attached. Vehicles may be garaged and left unattended for long periods, and flammable liquid fires may develop quickly and burn intensely. An automatic means of detecting an outbreak of fire in these areas and raising the alarm will allow safe and early evacuation of adjoining accommodation. Manual call points should also be provided for use when staff are in attendance.

9.25 In addition to burning intensely, flammable liquids develop immense heat, and therefore a heat detector in these circumstances will often operate before a smoke detector. In other situations, where a direct line of sight to a potential source of fire is possible, a flame detector may give an earlier warning. Further guidance on fire alarms and automatic fire detection is contained in HTM 82[10].

Noise

9.26 Excessive noise in individual areas, whether internally or externally generated and transmitted, can adversely affect operational efficiency and can cause discomfort. In this respect, ventilation, refrigeration, stand-by generator, and boiler plant should be selected and located to minimise noise transmission to the operations room within the communication centre. The limits and means of control advocated in Hospital Design Note 4[11] including its revisions[12], and the means of control given in Engineering Data Sheet DH1[13], should provide an acceptable acoustic environment.

9.27 There will also be a need for auditory privacy in some areas. Acceptable noise levels and, where applicable, any requirement for auditory privacy in individual spaces are shown on the activity data A-Sheets.

Control access

9.28 Primary engineering distribution control and isolation devices should be:

a. located in circulation rather than working areas;

b. protected against unauthorised operation, for example, switchgear and fuse boards should be housed in secure cupboards;

c. easily accessible for safe operation when authorised.

Engineering commissioning

9.29 It is essential that engineering services should be fully commissioned. HTM 17[14] describes the requirements which should be included in the design and building contract documents. Flow measurement and proportional balancing of air and water systems require that adequate test facilities, for example orifice plates, venturi valves, pitot tube tapping, etc, are incorporated at the design stage.

MECHANICAL SERVICES

General scope

9.30 The mechanical installation includes:

- heating (including boiler plant);
- ventilation (including plant and controls);
- cooling (part of communication centre only);
- hot and cold water (including storage and calorifier);
- industrial compressed air (including compressor);
- fire mains and hose reels;
- vehicle fuel storage and dispenser.

9.31 Recommended room temperatures, air change rates, hot water service temperature, etc are grouped under "Technical design data" on each A-Sheet. The B-Sheets give the disposition of engineering outlets for the activities described.

Boiler plant

9.32 Because the garage, workshop and communications centre are discrete functional units, the cost allowance for each includes independent boiler plant to allow each building to be provided on a "stand-alone" basis. A multi-boiler heat source may be appropriate for the larger units or where two or more units are located on the same site, particularly where there is a substantial summer DHWS demand and/or a mid-season heating load.

Heating

9.33 The heating installation should normally be designed for continuous operation, but where stations are likely to be closed or unmanned during the night or at weekends, provision should be made for temperature "set back" during

unoccupied periods. The garage, however, may be heated to ensure vehicles and equipment are maintained in a state of readiness. The heating requirement for the garage and other adjacent accommodation (offices, etc) may not coincide, and therefore independent distribution and control systems for these areas may be justified.

9.34 General space heating within administrative and amenity areas will usually be low pressure hot water (LPHW) radiators or convectors, while overhead unit heaters or radiant panels will be more suitable for the garage and workshop.

9.35 Whilst fan-assisted unit heaters mounted at high level may be the most suitable way of heating the garage, overhead radiant heaters in the workshop and garage maintenance bay may be found to have a number of advantages over convector heaters.

9.36 Under no circumstances should open flame heaters be used within or in close proximity to garages or workshops. For further information concerning the safety aspects of heating in these areas see SIB(6)22[15].

9.37 The equipment room in the communications centre may require cooling, but the remaining areas should be heated by low pressure hot water radiators or convectors.

9.38 Radiators should normally be located under windows or against exposed walls, with sufficient clear space between the top of the radiator and the windowsill to prevent curtains reducing the output, and adequate space below to allow cleaning machinery to be used. Where a radiator is located on an external wall, back insulation should be provided to reduce the rate of heat transmission through the building fabric.

9.39 Where space is restricted, or heat gains and/or losses are particularly variable, consideration should be given to the provision of thermostatically controlled fan-convectors fitted with low-limit control, but only where noise is unlikely to be a nuisance.

Temperature control

9.40 All radiators within administrative and amenity areas should be fitted with thermostatic radiator valves. These should be of robust construction and selected to match the temperature and pressure characteristics of the heating system. The thermostatic head, incorporating a tamper-proof facility for presetting maximum room temperature, should be controlled via a sensor located integrally or remotely as appropriate. To provide frost protection at its minimum setting, the valve should not remain closed below a fixed temperature.

9.41 Consideration should also be given to modulating the flow temperature to the heating appliances in accordance with the external ambient temperature.

9.42 The heating system in the garage area should be supplied from a constant temperature circuit with on/off control via averaging thermostats. The controls must be interlocked to ensure that the heating system is inoperable while the main garage doors are open. The system may be time-switch controlled to suit the station's operational schedule.

9.43 The heating system in the workshop should be supplied from a constant temperature circuit with automatic on/off control. It should have frost protection and time-limited manual override. It should be time-switched to suit the pattern of use.

General ventilation

9.44 Recommendations for ventilation of individual spaces are shown on Activity Data A-Sheets. Mechanical ventilation systems are expensive in terms of capital and running costs and planning solutions should be sought which take maximum advantage of natural ventilation. Openable window lights should be provided which allow optimum seasonal ventilation without prejudicing safety, security or comfort.

9.45 The design should allow for an adequate flow of air into any space having only mechanical extract ventilation, using transfer grilles in doors or walls. Such arrangements, however, should avoid the introduction of untempered air and should not prejudice the requirements of fire safety or privacy.

9.46 A separate mechanical extract ventilation system will be required for sanitary facilities to ensure that these rooms are maintained at a negative pressure when in use.

9.47 External discharge arrangements for extract systems should be protected against back pressure from adverse wind effects and located to avoid reintroduction of exhausted air into the building through air intakes and windows.

Ventilation controls

9.48 Supply and extract ventilation systems should include controls and indicator lamps appropriately located to confirm the operational status of each system. Alarms should be repeated as necessary. Controls will usually include those for temperature/time-switching functions; their selection should take account of the extent to which they can be linked to, or provided by, a management system serving the whole site, where appropriate.

Hot, cold and drinking water services

9.49 Guidance on the design and installation of cold water supply pipework and distribution systems is contained in HTM 27[19]. For frost protection purposes, and to prevent condensation staining decorative finishes, all cold water pipework, valves and flanges should be insulated and vapour sealed.

9.50 The requirements for the control of legionella bacteria in hot and cold water systems are set out in Health Technical Memorandum 2040[20]. To limit the risk from legionella, the water services should be designed, installed and commissioned in accordance with the recommendations in the Code.

9.51 The domestic hot water supply should be taken from the calorifier installation at an outflow temperature of 60°C ± 2.5°C, and distributed to all outlets so that the return temperature at the calorifier is not less than 50°C.

9.52 Outlet temperatures and fittings for sanitary equipment are shown on Activity Data sheets.

Vehicle fuel installation

9.53 The vehicle fuel installation should comprise buried storage tanks constructed to BS2594[23] each having a remote fill line, vent, sludge pipe and suction pipe. Each fill line should terminate at a common fill panel which should include a hydrostatic contents gauge for each tank. Fuel dispensing pumps should have local and remote indication of fuel flow with a remote print-out of fuel dispensed. The remote monitoring facility should also include pump on/off and reset controls.

ELECTRICAL SERVICES

General scope

9.54 The electrical installation includes:

- main intake switchgear, local isolators and distribution boards;
- lighting;
- power (including supplies to plant and garage doors);
- earth bonding of extraneous metalwork;
- telephone wiring;
- wireways for data links;
- clocks;
- fire alarms;
- public address.

These installations should comply in all respects with the current IEE Regulations for Electrical Installations[24] and conform to the requirements of HTM 2020[25], and the Electricity at Work Regulations 1989[56] with regard to portable equipment testing.

9.55 Health and Safety Executive Guidance Note HS(G)417[26] contains specific recommendations for electrical installations in garages and other places where motor vehicles are repaired. Further recommendations will be contained in a HSE Guidance Note HS(G)41 'Petrol Filling Stations – Construction and Operation'[54] and BS7117 'Measuring pumps and dispensers to be installed at filling stations and used to dispense liquid fuel'[55].

9.56 The electrical installation in areas where explosive concentrations of flammable gas or vapour may be present should comply with the recommendations of the Institute of Petroleum Electrical Safety Code[27]. The selection and installation of electrical apparatus in these areas should also be in accordance with BS5345[28].

9.57 Reference should be made to the activity data sheets for the recommended levels of internal illumination, disposition of outlets for power, telephone, communication systems, clocks, etc in individual spaces.

9.58 The point of entry for the electrical supply will be a switch cupboard housing the main isolators and distribution equipment. The space will also be the distribution centre for subsidiary electrical services. Wherever possible, all equipment should be mounted at a height to give easy access from a standing position. Switchgear should be lockable in the "off" position.

Electrical installations

9.59 The electrical installation in occupied areas of the station and communications centre should be concealed using PVC insulated cable in screwed steel conduit or trunking. Steel conduit and trunking wireways for communication systems should also be concealed wherever possible. External installations and the installation in the garage and workshop should comprise PVC insulated cables in galvanised screwed steel conduit installed on the surface with fittings of weatherproof pattern.

Electrical interference

9.60 Guidance concerning the avoidance and abatement of electrical interference is given in HTM 2014[29]. Fluorescent luminaires should comply with BS5394[30].

9.61 Care should be taken to avoid mains-borne interference and electrical radio frequency interference affecting radio communications, computers or other electronic equipment used here or elsewhere on the site.

Lighting

9.62 Practical methods of lighting the various functional spaces are contained in the CIBSE Lighting Guide[31]. Luminaires should be manufactured and tested in accordance with the requirements specified in the relevant sections of BS4533[32]. Their location should be readily accessible for lamp changing and maintenance, but with the overriding requirement that the recommended standard of illuminance is provided to the task areas.

9.63 Control of lighting is normally by local switches. The circuiting of luminaires should be arranged to control groups of fittings in order to provide flexibility of switching arrangements. Such a facility is particularly important in large spaces where the level of daylight is not uniform, and artificial lighting is likely to be needed for long periods in some areas remote from windows.

9.64 In areas where computer terminals are to be used, the lighting should be designed to avoid bright reflections on the screen and to ensure that the contents of the screen are legible. Further guidance can be found in CIBSE Lighting Guide LG3[33].

9.65 High-pressure sodium or metal halide lamps may be more economical than the fluorescent suitable in the workshop and garage. If a security system is being installed, consideration should be given to linking the non-emergency lighting to this circuit.

Socket-outlets and power connections

9.66 Sufficient 13 amp switched, shuttered socket-outlets, connected to ring or spur circuits, should be provided to allow all portable appliances likely to be used simultaneously to be individually supplied. The installation of twin outlets should be considered where the activities are in juxtaposition.

9.67 Domestic cleaning appliance flexible leads are assumed to be 9 metres long. Socket-outlets, usually in corridors, should be provided to enable the machines to operate over the whole area.

9.68 Fixed appliances rated up to 13 amps should be permanently connected to double-pole switched spur boxes and fused as required. Appliances rated in excess of this load, or those requiring a three-phase supply, should be permanently connected to separate final circuits from fuse-boards and independently switched at a local isolator of appropriate rating.

9.69 Local switches or other means of electrical isolation should be provided adjacent to plant and equipment to ensure the safety of operators and maintenance staff.

9.70 Plant and equipment should be provided with indicator lights to show when they are energised. Such indicators should be incorporated either in the control panel of the apparatus, in the control switch, or in the outlet from which the apparatus derives its supply. Vertically rising motorised doors should have an adjacent warning lamp, controlled by limit switches, to alert drivers to the potential hazard of partially-open doors.

9.71 In the communications centre, all socket-outlets in the equipment room should be capable of isolation from one switch located near the door of the room.

9.72 In workshop and maintenance areas, where the spillage of flammable liquids is a potential fire risk, no part of the fixed electrical installation should be installed less than one metre above floor level.

9.73 Where portable electric tools or handlamps are used, they should be supplied from special pin-indexed socket-outlets connected to a low-voltage transformer with a secondary output of 110 volts centre-tapped to earth.

9.74 Recommendations concerning the safe installation of steam/water pressure cleaners are given in HSE Guidance Note PM29[34]. Luminaires in the vehicle washing bay should be totally enclosed and splash-proof in accordance with the requirements of BS EN 60529[35]. Socket-outlets for supplying pressure cleaners should also be splash-proof and comply with BS196[36]. They should derive their supply from a safe-supply unit as specified in HN(82)39[37].

Socket-outlets for data processing equipment

9.75 Where the use of computers and associated printers is indicated on the activity data sheets, switched socket-outlets, connected to "clean" circuits, should be provided. A basic level of power conditioning, that is, surge suppression and noise filtering, should be incorporated into the main circuit supplying the equipment.

Emergency electrical supplies

9.76 A standby generator will be required for the communications centre. Guidance concerning the provision of emergency electricity supplies is contained in HTM 2011[38] and BS5266[39]. Emergency lighting should be provided on primary escape routes.

9.77 The electrical installation in the equipment room and operations room, within the communications centre, including all alarm, control, information and communication systems, should be supplied from essential circuits. Where low-power "no-break" supplies are required, the equipment should be specified to include integral battery back-up.

Alternatively, a central uninterruptible power supply (UPS) using half-hour battery back-up should be provided.

9.78 Safety lighting in the station and workshop areas should be self-contained battery-operated with integral changeover relay and charger. It should be suitable for non-maintained operation, in the event of mains failure, for a period of one hour.

Entrance door system

9.79 In the communications centre, an intercom system, complete with door opening device, should be provided between the main entrance door and general office, but transferable to the operations room at night. In an ambulance station, a bell push should be provided at the main entrance door to operate a sounder in the supervisor's office.

Intercommunication system

9.80 For larger ambulance stations, an emergency call alarm which is easily distinguishable from a fire alarm and which is clearly audible from all parts of the station may be required. For very large stations, a public address system may also be required.

Telephones

9.81 Central telephone facilities for internal and external calls should be provided in accordance with the requirements shown on the activity data sheets. Wiring should terminate at each extension point in a standard line jack unit.

9.82 Although of limited scope in the context of ambulance service communications, guidance concerning the provision of telephone services and equipment, including the internal cabling distribution and handsets, is contained in HBN 48 – 'Telephone services'[40].

9.83 If outlets are required for coin-box telephones, they should be connected direct to the public network by separate exchange circuits and not routed via the switchboard.

Wireways for data links and communication systems

9.84 Normally, data transmission and communication cables can be accommodated in the extra-low voltage compartment provided for telephones and other systems. More extensive provision, for example, floor trunking, may be required in the communications centre.

Communications centre equipment

9.85 The multi-channel communications recorder to record and time-index all incoming and outgoing telephone and radio messages in communications centres (installed under a separate contract) must be supplied from an essential circuit and be battery maintained.

9.86 The choice of communication and operational control systems will depend primarily on the area covered and its topography, density of population and the organisational arrangements necessary to meet the demand. In addition to VHF and UHF radio links, other high-technology systems incorporating computers, high-speed printers and modems are required for communication between communications centres and operational units.

9.87 Although not included in the Works Cost Allowance, the continuing rapid changes in communication technology, and the increasing competition between manufacturers offering alternative solutions, require that the engineering standards and operational requirements for the communication system are clearly specified. Technical guidance concerning the planning and engineering of communication systems for the ambulance service is given in a series of engineering data sheets (see reference numbers 41 to 50) which provide comprehensive information without prescribing a detailed design.

Electric clocks

9.88 Clocks should operate in conjunction with a master impulse clock system. In the communications centre they should be of the digital 24-hour type, and should display the time, day and date. The system should be supplied from an essential circuit and should be battery maintained. However, synchronous clocks may be more suitable in ambulance stations and workshops. The locations of clocks are indicated on the activity data sheets. In circulation areas, clocks should be installed only where they can be viewed by numbers of staff/visitors.

Lightning protection

9.89 Protection against lightning should be provided in accordance with HTM 2007[25] and HSE Data Sheet DB2[50]. Further guidance concerning the earthing requirements for masts, aerial feeder cables and equipment rooms is given in Home Office publication DT.50/74/1[51].

INTERNAL DRAINAGE

General scope

9.90 General design guidance is given in the relevant British Standards and Codes of Practice, including BS5572[52] and the current Buildings Regulations. Recommendations regarding spatial and access requirements for public health engineering services are given in HSE Data Sheet EA5[53].

9.91 The gradient of branch drains should be uniform and adequate to convey the maximum discharge to the stack without blockage. Practical considerations, such as available angles of bends/junctions and their assembly, as well as space considerations, usually limit the minimum gradient to about 1:50 (20 mm/m). For larger pipes, for example, 100 mm diameter, the gradient may be less, but will require workmanship of a high standard, if adequate self-cleansing flow is to be maintained. It is not envisaged that pipes larger than 100 mm diameter will be required within these buildings.

9.92 The drainage design should ensure that flammable liquids are prevented from entering any drain or sewer. The surface drainage from petroleum dispenser and fuel storage areas should discharge through petroleum intercepting chambers via trapped gullies.

Operational considerations

9.93 Unusual and difficult maintenance problems can arise because of user interference and abuse. For example, the disposal of paper towels into WCs after hand-washing or after their misuse for some other purpose is a frequent cause of blockages, particularly in long branches laid to flat gradients. Adequate provision of disposal receptacles or, where appropriate, the installation of warm-air dryers can help to mitigate this problem.

Materials specification

9.94 Waste pipework should, as far as is practicable, be concealed. Although adequate for drainage requirements, uPVC may not always be acceptable to the fire officer.

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(21) **Piped medical gases, medical compressed air and medical vacuum installations (HTM 2022).** NHS Estates (in preparation).

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(28) **BS5345** Code of practice for selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture). Part 1 1976. Part 2 1979.
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(55) **BS7117** Metering pumps and dispensers to be installed at filling stations and used to dispense liquid fuel.
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(56) **SI 635:1989** Electricity at Work Regulations 1989. HMSO 1989.

10.0 Cost information

Introduction

10.1 For all types of health building, it is clearly of vital importance that building and running costs should be kept as low as possible consistent with acceptable standards. Within this general context, Health Building Notes provide a synopsis of accommodation for health buildings which the Department of Health in conjunction with the National Health Service, recommends for the provision of a given service.

Works cost

10.2 To prepare an estimate of the works cost for a scheme, reference should be made to the 'Capricode' Health Building Procedures Manual (Chapter 1, Stage 1, Annex 1c). The total departmental cost for a scheme is derived by aggregating the cost of the functional units, Essential Complementary Accommodation (ECA) and Optional Accommodation and Services (OAS) as appropriate to the particular scheme.

10.3 The works cost covers the building and engineering requirements set out in this Note. In the costing of the functional units it has been assumed that they will be combined to form an ambulance station which will not be incorporated into a hospital. Functional units and activity spaces and areas for the training centre accommodation are not included in this Note. To produce a scheme cost it will be necessary to combine the elements present on the site. It may be an ambulance station only with, if it is large enough, the necessary vehicle fuel dispensing facility; it may have a workshop or control centre added, or be a total scheme comprising all elements. "On-costs" will be separately assessed so the standard percentages will not apply to these schemes.

Functional unit

10.4 The functional units for this Note are:

a. 3, 6, 12, 16, 20 and 30 vehicle bay ambulance station;

b. communications centre;

c. 3 and 5 bay vehicle workshop;

d. vehicle fuel storage and issue.

The activity spaces and areas used for costing the functional units are listed at the end of this chapter.

Dimensions and areas

10.5 In determining spatial requirements, the essential factor is not the total area provided but the critical dimensions, that is, those dimensions critical to the efficient functioning of the activities which are to be carried out. To assist project teams in preparing detailed design solutions for the rooms and spaces, some studies have been carried out to establish dimensional requirements in the form of critical dimensions. The results of these studies appear as ergonomic diagrams in HBN 40 – 'Common Activity Spaces'.

10.6 It is recognised that for development planning and at the earliest stage of the design process, it may be convenient for designers to have data available which will enable them to make an approximate assessment of the sizes involved. For this reason, the schedules of areas which have been prepared for the purpose of establishing the Departmental Cost Allowances (DCAs) are included at the end of this chapter. It is emphasised that the areas published do not represent recommended room sizes nor specific individual entitlements.

Circulation

10.7 The schedule of areas used for costing will have an area for circulation, within each functional unit, shown as an addition. It should be noted that, for convenience, the areas allowed for planning provision, engineering zone and for partitions are included in the area allowed for circulation.

Essential complementary accommodation (ECA)

10.8 This comprises activity spaces which are essential to the running of the unit but which in certain circumstances may be available in a convenient location elsewhere. The amount of ECA which will need to be provided as part of an individual project will therefore vary according to the extent of the provision available elsewhere. The items costed in this Note are:

a. ambulance station: seminar room – small
large.

Optional accommodation/services (OAS)

10.9 This Note draws attention, where appropriate, to alternative ways of providing services or facilities, including the likely cost implications. This information will allow project

teams to select the solution which is most suitable to their needs. The items costed in this Note are:

a. communications centre: centralised uninterruptible power supply;

b. workshop: steam cleaning bay.

10.10 The following OAS discussed in this Note have not been costed:

a. ambulance station: automatic vehicle washing plant;

b. workshop: locker, changing etc. for female staff (see paragraph 7.29); additional facilities (paragraphs 7.36 to 7.38).

Communication – plant space

10.11 Boiler/plant rooms, together with electrical switchrooms and a room for storage of medical gas cylinders are included in the DCAs.

Engineering services

10.12 The following engineering services as described in the engineering chapter and exemplified in activity data are included in the DCAs. Each building is assumed to stand alone and not on a hospital site:

a. Mechanical services:
   - (i) cold water;
   - (ii) drinking water;
   - (iii) fire service mains and hose reels;
   - (iv) water storage;
   - (v) boiler and ancillaries;
   - (vi) space heating (includes heating garage to 7°C);
   - (vii) air cooling (part of communications centre);
   - (viii) hot water service;
   - (ix) extract ventilation (sanitary and catering accommodation, workshop vehicle exhaust and garage system)
   - (x) gas (fuel);
   - (xi) compressed air (workshop);
   - (xii) automatic controls;
   - (xiii) thermal insulation;

b. Electrical services:
   - (i) switchgear;
   - (ii) lighting (including safety lighting);
   - (iii) power outlets;
   - (iv) socket-outlets;
   - (v) socket-outlets (110 V workshop and maintenance bay);
   - (vi) stand-by generator (communications centre);
   - (vii) conduits for telephones and data links including telephone wiring;
   - (viii) intercom (communications centre entrance);
   - (ix) synchronous clocks (station and workshop only);
   - (x) impulse clocks (communications centre);
   - (xi) fire alarm system;
   - (xii) public address system (ambulance station);

c. Group 1 Equipment

   General:
   - (i) water boilers (catering);

   Workshop:
   - (ii) vehicle hoists;
   - (iii) brake tester;
   - (iv) tyre changer;
   - (v) wheel balancer;
   - (vi) lubrication equipment;

   Ambulance station:
   - (vii) washing machine;
   - (viii) tumble dryer;

   Communications centre:
   - (ix) stand-by generator;
   - (x) centralised uninterruptible power supplies (OAS);

   Fuel dispensing:
   - (xi) petrol or diesel fuel dispensing facilities including storage, pump and monitoring equipment.

10.13 The following engineering services are not included in the DCA:

a. communications centre: all telephone, radio and data processing equipment control consoles (workstations);

b. training centre: all services.

Ambulance station accommodation

Schedule of areas

Activity space – vehicle bays	3 No	6 No	12 No	16 No	20 No	30 No
	m^2	m^2	m^2	m^2	m^2	m^2
GARAGE						
garage	96.00	240.00	480.00	640.00	800.00	1,200.00
	96.00	240.00	480.00	640.00	800.00	1,200.00
circulation etc	5.00	12.00	24.00	32.00	40.00	60.00
	101.00	252.00	504.00	672.00	840.00	1,260.00
ADMINISTRATION BLOCK						
entrance						
supervisor's office	8.00	8.00	8.00	10.00	12.00	14.00
station officer's office	–	–	–	12.00	12.00	12.00
female changing/WC/shower	12.00	12.00	12.00	12.00	15.00	15.00
male changing/WC/shower	12.00	15.00	18.00	21.00	24.00	32.00
duty room	12.00	15.00	25.00	32.00	40.00	50.00
recreation	–	–	–	–	30.00	45.00
kitchen/dining	11.00	11.00	17.00	21.00	25.00	35.00
cleansing/laundry	10.00	10.00	10.00	14.00	14.00	18.00
disposal room	4.50	4.50	6.00	6.00	6.00	6.00
store – blankets/linen	4.00	5.00	7.00	8.00	9.00	12.00
store – medical supplies	3.00	4.00	6.00	7.00	8.00	10.00
store – vehicle equipment	2.00	3.00	4.00	5.00	6.00	8.00
store – general	3.00	4.00	6.00	7.00	8.00	10.00
cleaners' space	2.00	3.00	4.00	5.00	6.00	8.00
dirty linen store	1.50	2.50	4.50	6.00	7.50	9.00
medical gas cylinder store	2.00	2.00	2.00	4.00	6.00	8.00
electrical switchgear	2.00	2.00	2.00	4.00	4.00	4.00
assisted toilet	4.50	4.50	4.50	4.50	4.50	4.50
boiler room	8.00	9.00	12.00	12.00	18.00	20.00
	101.50	114.50	148.00	190.50	255.00	320.50
circulation etc	36.00	40.50	52.50	67.50	90.50	113.50
	137.50	155.00	200.50	258.00	345.50	434.00
garage	101.00	252.00	504.00	672.00	840.00	1,260.00
	238.50	407.00	704.50	930.00	1,185.50	1,694.00
Departmental total m^2	**240.00**	**410.00**	**705.00**	**930.00**	**1,185.00**	**1,695.00**

Communications centre accommodation

Schedule of areas

Activity space		m^2
Entrance		15.00
General office		25.00
Control manager's office		25.00
Communications room		132.00
Communication equipment room		30.00
Store – records		18.00
Store – document/stationery		11.00
Kitchen/dining		20.00
Cleaners' space		11.00
Lockers/changing/WC/shower – female		36.00
Lockers/changing/WC/shower – male		36.00
Assisted toilet		4.00
Stand-by generator/switchgear		12.00
Boiler room		8.00
		383.00
Circulation etc		63.00
		446.00
Departmental total	m^2	**445.00**

Workshop accommodation

Schedule of areas

Activity space		3-bay m^2	5-bay m^2
Office		11.00	11.00
Lockers/changing/WC/shower		14.00	14.00
Workshop		129.00	215.00
Store		27.00	34.50
Oil store		14.00	14.00
Kitchen/dining/rest		–	15.00
Pantry		10.00	–
Boiler/compressor room		12.00	12.00
		217.00	315.50
Circulation etc		33.00	49.50
		250.00	365.00
Departmental total	m^2	**250.00**	**365.00**

Fuel storage

10,000 litre fuel storage and pump	No areas
20,000 litre fuel storage and pump	No areas

Essential complementary accommodation

	Space area m^2	Circulation etc m^2	Total m^2
Seminar room – small	20.00	5.00	25.00
– large	38.00	7.00	45.00

Optional accommodation and services

	Space area m^2	Circulation etc m^2	Total m^2
Uninterrupted power supply		Engineering cost – no area	
Steam cleaning bay	43.00	4.50	47.50

11.0 Activity data

11.1 The term "activity data" refers to an information system developed to help project and design teams by defining the users' needs more precisely. It comprises three types of information sheet: activity space data sheets (known as A-Sheets), their supporting activity data sheets (known as B-Sheets), and A-Sheet component listings (known as D-Sheets).

11.2 A-Sheets record in more detail than is described in this Note each task or activity that is performed in a particular activity space (which may be a room, space or bay) together with details of the environmental conditions and the technical data necessary to enable the activities to be performed. Each A-Sheet also contains a list of the titles and code numbers of the relevant B-Sheets.

11.3 B-Sheets provide narrative text and graphics to scale relating to one activity. They show equipment fitted or supplied as part of the building, and the necessary engineering terminals. There are also "component B-Sheets" which show a range of particular components rather than an activity.

11.4 D-sheets provide information about the total quantities of components (excluding those in Group 4 – see paragraph 1.6) extracted from all the B-Sheets selected for inclusion in an individual A-Sheet.

11.5 Further information about the use and preparation of activity data and an explanatory demonstration disk can be obtained from NHS Estates, Department of Health, 1 Trevelyan Square, Boar Lane, Leeds LS1 6AE.

Activity Data applicable to this Note

11.6 The A-Sheets recommended for the activity spaces in this Note are either new sheets, amended ones, or selected from existing sheets. A list of A-Sheet code numbers and titles is given in the following pages.

11.7 Further activity data sheets may be selected, or drawn up by project teams to their own requirements, for any services not described in the Note or included in the list. Members of project teams are advised to contact their Regional Activity Data Co-ordinator/Welsh Office for information and advice about the selection of activity data, at an early planning stage. However, in order to ensure consistent and economic provision, variations from the A-Sheets recommended for the spaces covered in this Note should be considered only where it has been decided that the function of a space will substantially differ from that described. For advice on specialist services associated with Activity DataBase contact NHS Estates.

List of activity data A-Sheets

Activity space	A-Sheet code No	Para no in HBN
Ambulance station		
Entrance	J0111	4.3
Office: supervisor	M0529	4.7
Office: station officer	M0530	4.8
Duty room	M1708, M1709, M1710	4.9
Staffroom: recreation	D0113, D0114	4.11
*Seminar room	H0512, H0513	4.12
Kitchen/utility/dining	P1104, P1105	4.13
Utility room: cleansing	Y0505	4.14
Disposal room/dirty linen store	Y0609	4.15
Locker/changing/WC/shower – female	V1310	4.17
Locker/changing/WC/shower – male	V1311	4.17
WC – wheelchair	V1203	4.17
Stores – blankets/linen	W1404	4.28
medical supplies	W1518	4.28
vehicle equipment	W1519	4.28
records	W1509, W1510	4.28
Cleaners' room	Y1210	4.29
Medical gas cylinder store	W1525	4.18
Switchgear: cupboard	K0105	3.21
Boiler house/plant room	K0701	3.19, 6.37
Garage		
Garage: 6–30 bays including wash bay	K0315	4.19
Garage: 3–5 bays including wash bay	K0316	4.19
Vehicle fuel installation	K0801	4.30
Communications centre		
Entrance	J0110	5.30
Office: general	M1017	5.30
Office: divisional officer	M0527	5.31
Kitchen/dining/rest area	P1103, P1104, P1105	5.32
Operations room	M0404	5.11
Communications: equipment room	K0511	5.21
Locker/changing/WC/shower – female	V1310	5.34
Locker/changing/WC/shower – male	V1311	5.34
WC – wheelchair	V1203	5.34
Cleaners' room	Y1210	5.35
Document store	W1510	5.36
Switchgear	K0105	5.40
Boiler house/plant room	K0701	5.38
Stand-by generator	K0110	5.37
Workshop		
Workshop: 3-bay	K0310	7.20
Workshop: 5-bay	K0311	7.20
Office: general	M1017	7.16
Stores: 3-bay	W1520	7.18
Stores: 5-bay	W1521	7.18
Oil store	W1522	7.26
Kitchen/dining/rest-room: 3-bay	P0612	7.27
Kitchen/dining/rest-room: 5-bay	P1103	7.27
Staff changing: WC/shower	V0113	7.29
**Steam cleaning/rust-proofing	K0312	7.30

*ECA **OAS

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Dd. 296809 C15 2/94 17647

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